# WESTERN GAS

●Have you stopped to think just why it is that *gas* is the accepted *perfect fuel* for cooking?

Isn't it because the gas range industry has developed in the modern gas range the most efficient cooking equipment that can be devised . . . and made these splendid modern ranges so that they utilize the latent power of gas to the greatest possible degree.

Such excellent improvements as the insulated oven, the automatic lighter, and the ROBERTSHAW *oven control* have revolutionized the cooking procedure and made every woman long for a modern gas range.

Throughout the entire evolution of the present day gas range, the Robertshaw has been a contributing factor of prime importance. Since the earliest days of oven control, the Robertshaw has held an outstanding position for dependable, trouble free and service free performance. Make sure that your ranges have the Robertshaw and that you use it aggressively in all your range selling work.

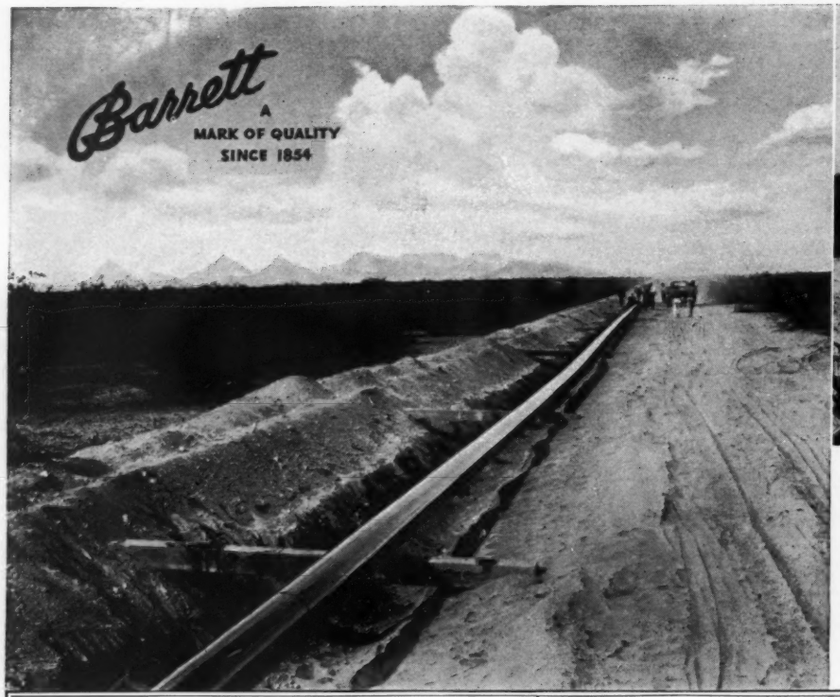
**THE ROBERTSHAW THERMOSTAT CO.**
Youngwood, Pa.

NRA MEMBER U.S. WE DO OUR PART

*The Model "F" or the Model "FC" Robertshaw are provided as standard equipment with all types of modern gas ranges.*

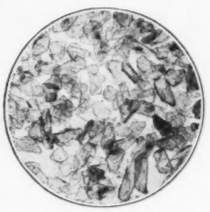
Model "F"

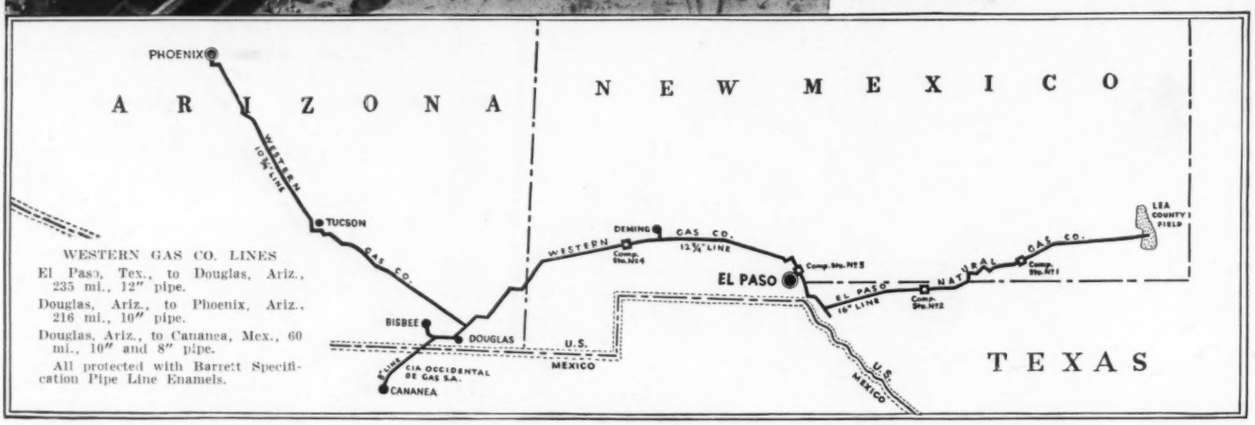
# ROBERTSHAW "Automati-Cook"



Reproduction of the micrograph at the right shows the interlocking of the flakes of the internal reinforcement used by Barrett. By laminating with the waterproofing agent they give Barrett Pipe Enamels unusual toughness and resistance to soil stresses.

For pipe of large diameter, The Barrett Company will furnish equipment required to revolve pipe and spread enamel.






WESTERN GAS CO. LINES

El Paso, Tex., to Douglas, Ariz., 235 mi., 12″ pipe.

Douglas, Ariz., to Phoenix, Ariz., 216 mi., 10″ pipe.

Douglas, Ariz., to Cananea, Mex., 60 mi., 10″ and 8″ pipe.

All protected with Barrett Specification Pipe Line Enamels.

# Protecting Over 500 Miles of Western Gas Co. Lines

**Barrett Specification Pipe Line Enamels protect over 500 miles of Western Gas Company's natural gas lines against earth acids, moisture, climatic conditions and electrolysis. These waterproof, dielectric coatings inhibit destructive action of elements which quickly age and injure unprotected metal structures. Barrett Pipe Line Enamels applied according to Barrett Specifications by approved Barrett methods, meet every requirement for dependable pipe line protection. The Barrett Technical Staff and Barrett Field Engineers will gladly cooperate in working out special protective coatings and technique as required. Phone, write or wire.**

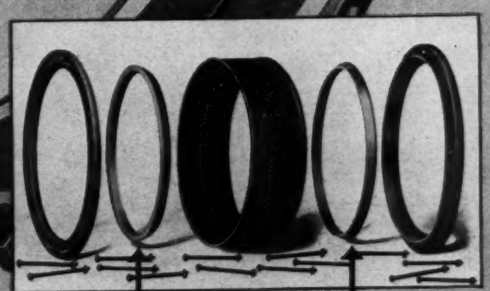
THE BARRETT COMPANY, 40 Rector St., New York, N. Y.

*Barrett Specification*

**PIPE LINE ENAMELS**

# DOUBLE SEALED

## DRESSER DUAL-GASKET CONSTRUCTION ASSURES ABSOLUTELY AND PERMANENTLY TIGHT JOINTS




DRESSER Couplings are tightly sealed on *both sides* by gaskets, the design and composition of which are *known* to be the most efficient for the service conditions they must endure. Dresser design keeps the gaskets closely confined, assures proper distribution of the gasket load, and makes possible unusual angular deflection at the joint. Dresser gasket compounds *retain* the correct degree of resiliency. These special compounds have been evolved as the result of nearly fifty years of field experience with gas lines of all sizes and pressures, plus the knowledge gained from continual laboratory tests. No other joint has this background.

**S. R. DRESSER MFG. COMPANY**
**Bradford, Pa.**

*In Canada*: Dresser Mfg. Company, Ltd., 32 Front Street, W., Toronto, Ontario

# DRESSER COUPLINGS *DOMINATE!*


February, 1934, Volume X, Number 2. Western Gas is published by Western Business Papers, Inc., at 810 South Spring Street, Los Angeles, California. Subscription price (in advance) 25 cents the copy; $2.00 per year; 2 years, $3.00; $3.00 per year foreign. Entered as second class matter June 1, 1925, at the postoffice at Los Angeles, under the Act of March 3, 1879.

In 1922 the United States Pipe and Foundry Company shipped the first length of de Lavaud centrifugally cast pipe commercially produced in the United States. By 1932 more than 80 million feet of de Lavaud pipe had been installed in the United States alone. Every length of those 80 million feet may be confidently expected to surpass, under equal conditions, the long-life records of cast iron pipe made a century ago. For de Lavaud pipe since the first shipment in 1922 has been stronger cast iron pipe than our best pit cast pipe. It has rightfully been considered ideal pipe for service underground.

# Now we are ready to announce Super-de Lavaud Pipe

## *with impact-resistance increased 100 per cent*

IT will be recognized that the hazard of incipient rupture in the handling of pipe in transit, unloading and distributing is beyond the control of the manufacturer.

In 1930, the United States Pipe and Foundry Company undertook the self-imposed task of reducing that hazard in the only way possible—by increasing the impact-resistance of the pipe and at the same time maintaining a sound balance between modulus of elasticity and modulus of rupture. In that year of depression, we built and equipped one of the finest foundry research laboratories in the world.

In 1932, we began to produce at our Burlington plant, and later at other plants, a Super-de Lavaud Cast Iron Pipe, centrifugally cast, by a new patented process developed in our Research Laboratory. The outstanding feature of this new pipe is an extraordinary increase in impact-resistance.

For thirteen months we have been in production. During this time all our centrifugally cast pipe has been made by the new Super-de Lavaud process. After a year's experience in production and shipments we are now ready to announce that:

**SUPER-DE LAVAUD CAST IRON PIPE, centrifugally cast by our patented improved process, is *shatter-proofed* to the extent that *impact-resistance has been increased more than 100 per cent.* Thus, maximum protection against hazards of handling and transporting has been built into Super-de Lavaud Pipe in order that pipe which is perfect *for service underground* shall remain perfect *from plant to underground.* While the human element in handling pipe is always unpredictable, it now becomes a negligible factor under any but abnormal conditions in transit, unloading and laying.**

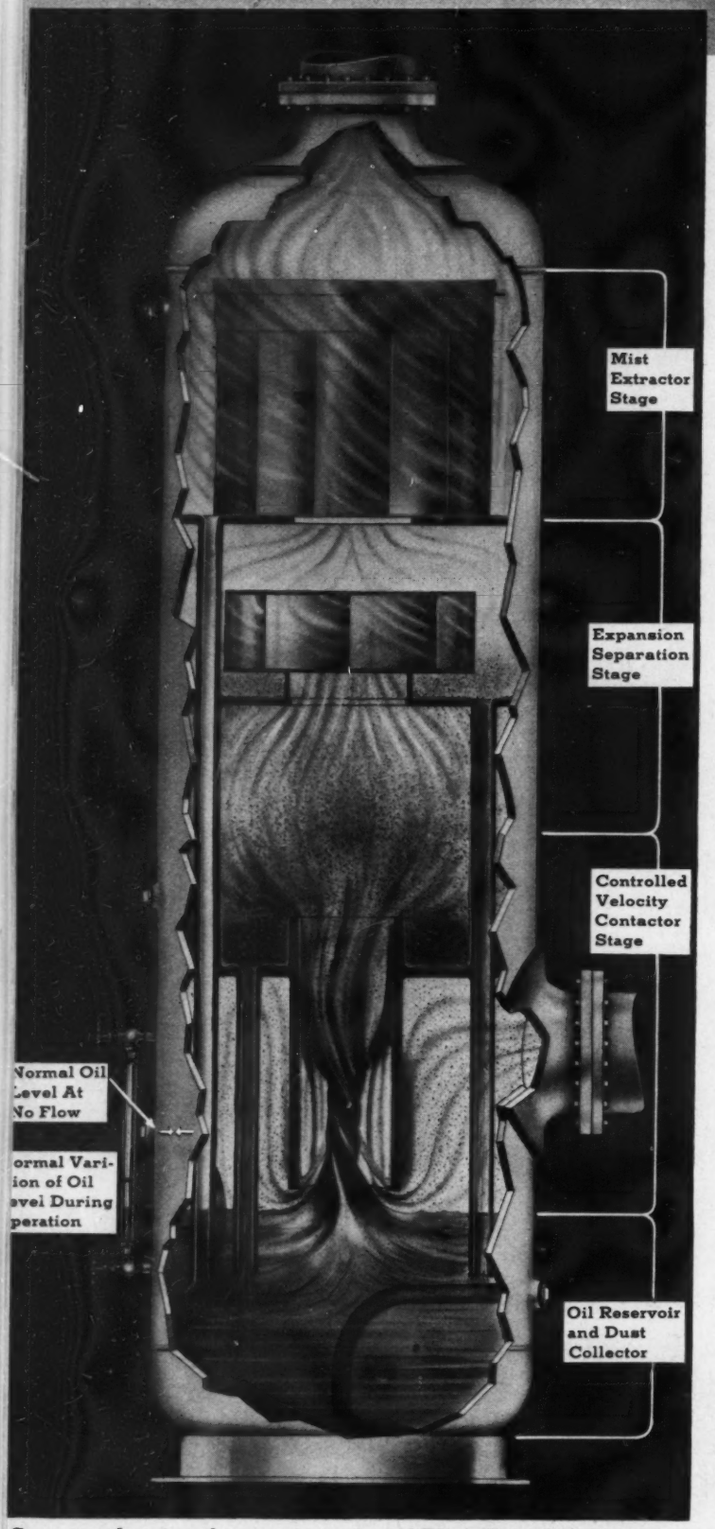
The major advantage resulting from the extraordinary increase in the impact-resistance of Super-de Lavaud Pipe is in protection against the hazard of damage in handling and transit but it must be obvious that this pipe will render super-service underground. Super-de Lavaud Pipe establishes a standard of its own exceeding the requirements of the Federal Specifications Board for this product. *Send for descriptive booklet.*

**UNITED STATES PIPE AND FOUNDRY COMPANY**

GENERAL OFFICES . . . . BURLINGTON, N. J.

FOUNDRIES AND SALES OFFICES THROUGHOUT THE UNITED STATES

# BLAW-KNOX GAS CLEANERS


Mist Extractor Stage
Expansion Separation Stage
Controlled Velocity Contactor Stage
Normal Oil Level At No Flow
ormal Vari- ion of Oil evel During peration
Oil Reservoir and Dust Collector

Cut away drawing showing operation of Blaw-Knox Gas Cleaner.

**Deliver clean gas.**

**Remove all dust and liquid entrainment.**

**Operate without attention or shutdowns over long periods. Are capable of continuous operation.**

**Offer negligible resistance to gas flow.**

**Collected material is taken from path of gas flow and is quickly removable without shutting off gas flow.**

**Liquid contactor type.**

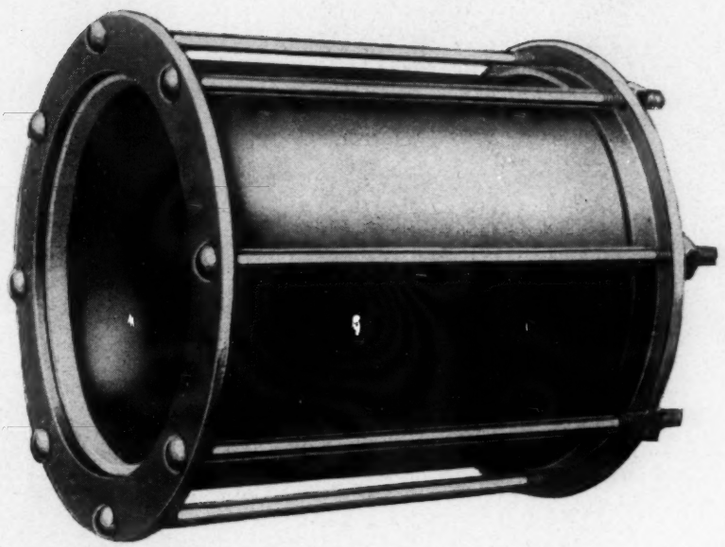
Clean gas reduces maintenance costs, service calls and insures better public relations. Let us tell you about the experience of others using Blaw-Knox Gas Cleaners. We will be glad to demonstrate how this equipment can be adapted to the working conditions of any company.

BLAW-KNOX COMPANY
2016 Farmers Bank Building
Pittsburgh, Pa.

BLAW-KNOX GAS CLEANERS

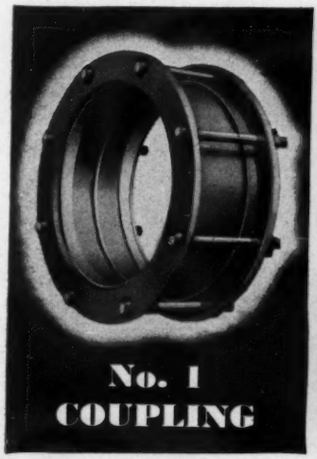
# ◆DAYTON◆

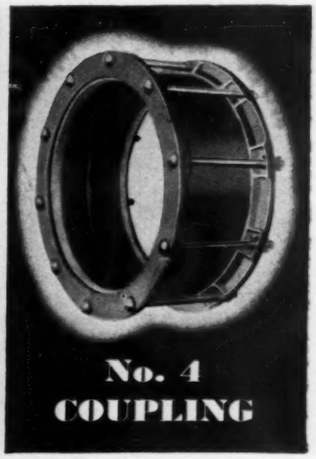
## NO. 5 ALL STEEL SLEEVE



An efficient, economical means for easily and rapidly repairing broken gas lines. Also used extensively as an expansion joint in the original installation of welded lines. For either purpose the No. 5 Sleeve produces a joint whose strength and flexibility make it permanently tight under all conditions.

**THE NATIONAL-SUPERIOR CO. • DAYTON, OHIO**





# CAST IRON PIPE

## with gas-tight mechanical joints

**Several mechanical joints are made by C. I. P. R. A. members.**

**One basic feature is common to all — the stuffing box principle.**

**All are delivering gas-tight performance in high pressure service.**

**THE CAST IRON PIPE RESEARCH ASSOCIATION**
**Thomas F. Wolfe, Research Engineer**
**309 Peoples Gas Building, Chicago, Ill.**

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# WESTERN GAS

"Reg. U. S. Pat. Off."

Publication Office: 810 South Spring Street, Los Angeles, Calif.
District Offices: 110 East 42nd Street, New York; 447 Sutter Street, San Francisco

MEMBER PERIODICAL PUBLISHERS INSTITUTE — MEMBER AUDIT BUREAU OF CIRCULATIONS


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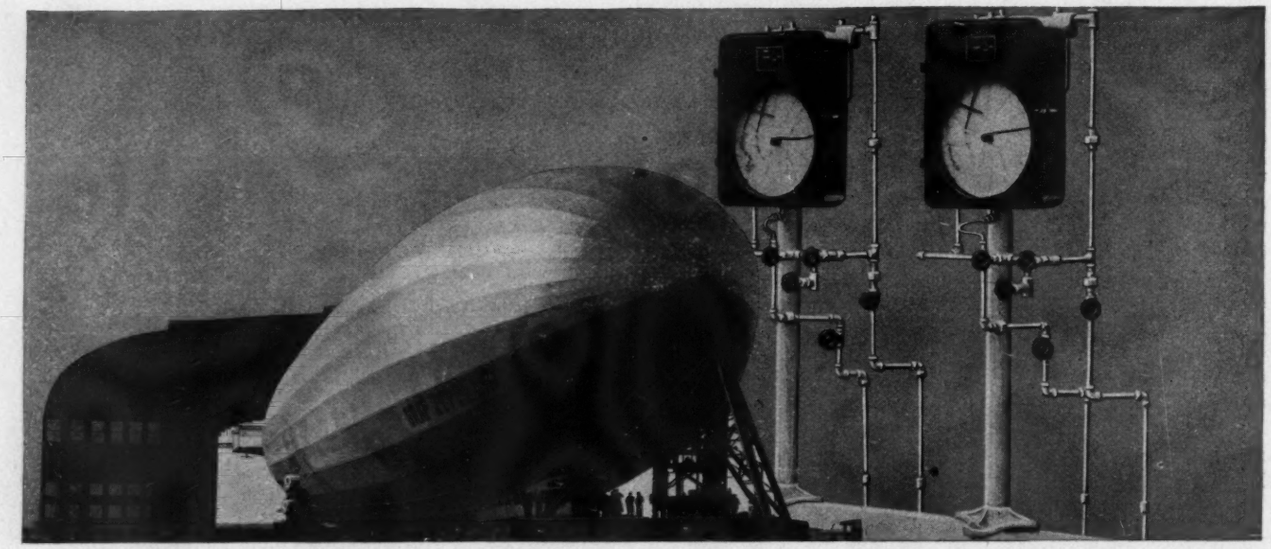
JAY JENKINS, Publisher. GEORGE H. FINLEY, Editor. CRAIG ESPY, Eastern Manager.
OFFICIAL PUBLICATION, Pacific Coast Gas Association; Southern California Meter Association.



# HOW THE GRAF ZEPPELIN IS REFUELED

**•American Meter Company orifice meters have been utilized in refueling at Akron, Lakehurst, Los Angeles, Tokio and Pernambuco, Brazil, to attain exacting degree of accuracy required**

Burning gas instead of gasoline in her motors, the Graf Zeppelin was refueled with 750,000 cubic feet of fuel gas before her recent trip homeward. Sixteen hours were required for the operation. The fuel gas is approximately 65 per cent Pyrofax and 35 per cent hydrogen.

This setup at Akron for measuring the fuel gases is the same as employed in past refuelings at Tokio, Los Angeles, Lakehurst, and the permanent base in Pernambuco, Brazil.

Choice of American Meter Company instruments in all cases is evidence of international recognition of their accuracy . . . accuracy established in the displacement measurement of the smallest laboratory pilot light's flow and maintained throughout the entire range of applications. Write for Engineering Bulletin EG2.

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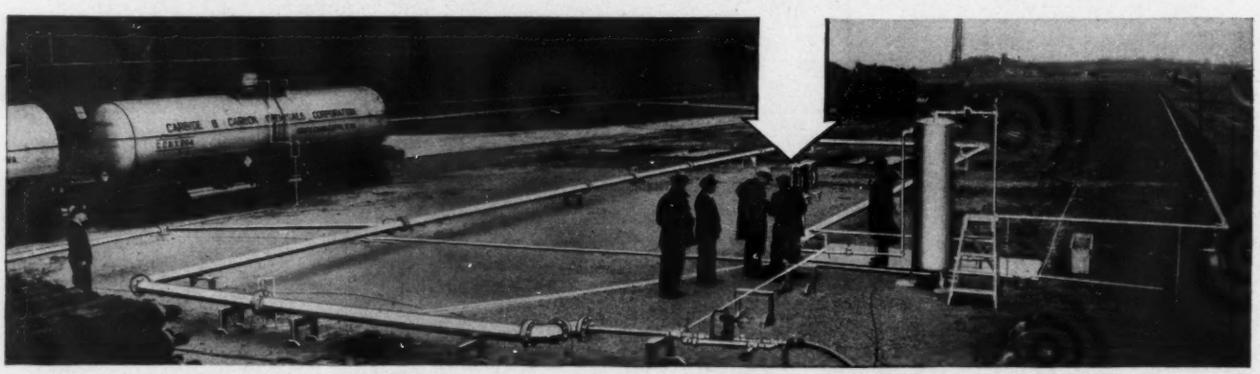
INCORPORATED
*Measurement and control of Gas, Oil, Steam, Air and Liquids*
*ESTABLISHED 1836*
METRIC METAL WORKS *ERIE, PENNSYLVANIA*

Albany Baltimore Birmingham Boston Chicago Denver Erie Kansas City
Los Angeles Philadelphia Pittsburgh New York San Francisco
WESTCOTT & GREIS, INC., Dallas, Tulsa
CANADIAN METER CO., LTD., Hamilton, Ontario

The Pyrofax gas is introduced into one end of the piping layout and hydrogen into the other end. These gases are mixed at a common outlet, and then flow through a tunnel into the air dock. Liquefied Pyrofax from the tank car is passed through a steam vaporizer, the steam being provided from the railroad locomotive shown on the siding. The hydrogen is brought in through a manifold connection and thence through a main control valve. To maintain the temperature of the two gases constant, and thereby eliminate the necessity for making corrections for flowing temperature, the hot Pyrofax gas from the vaporizer is cooled by refrigeration and the hydrogen is heated. Pyrofax gas supplied and refueling operations were supervised by Union Carbide & Carbon Corporation. Photo by courtesy of Goodyear Zeppelin Corporation.



February, 1934

# WESTERN GAS

"Reg. U. S. Pat. Off."

Vol. X, No. 2

**A Monthly Journal of the Gas and Gas Appliance Industries in *Western America***

## Federal Financing for Electric Appliance Buyers . . . What Next?

IF there is any doubt that one thing leads to another, where government incursion into business is concerned, consider the federal power experiment in the Tennessee Valley. It grows plainer day by day that the Tennessee Valley Authority is acquiring an all-time toe-hold upon the electric industry of this section.

Gas men, along with the electric fraternity, may view with alarm the successive steps through which T.V.A. policy is unfolding.

To get distribution facilities quickly T.V.A. buys portions of private electric systems in Mississippi, Alabama, Tennessee . . . encourages farmers to organize districts for wholesale purchase of government power . . . throws its support to municipal power projects in many communities.

And now comes the Electric Home and Farm Authority, Inc., subsidiary of T.V.A., offering commercial credit to purchasers of electric appliances. This latest aggravation means electric competition in a most virulent form for gas companies in the seven-state scope of T.V.A. It is in fact a nation-wide threat, for the E.H.F.A. is regarded as experimental in the Tennessee Valley and subject to wider application.

To pass this electric appliance financing agency in brief review, it came into being by presidential executive order on December 19 as a subsidiary of the Tennessee Valley Authority. Having the general powers and functions of a mortgage loan company this most recent of government corporations begins operations with a million dollar original capital, from the Public Works fund.

Its organization, incidentally, marks the government's first entrance upon financing purchases for the ultimate consumer.

Its purposes, as announced by T.V.A. director David E. Lilienthal, are these:

1. To assist in financing consumer purchases of low-cost electrical appliances.
2. To secure electric rate reductions through negotiations with utilities.
3. To conduct educational and research work calculated to further lower the cost of electric equipment.

While no complete announcement has been issued on the E.H.F.A. program, statements of Mr. Lilienthal indicate that it will take somewhat the following form:

Appliances will be sold and delivered through normal channels, and contracts taken up by the E.H.F.A. Financing will be available on electric ranges, refrigerators, water heaters and small farm equipment such as electric motors, through four-year contracts calling for minimum down payments.

Collections over a four-year period will be made on the utilities' bills, payment coming from the utilities monthly to the E.H.F.A. for amounts collected on equipment. The customer will pay a small carrying charge.

Customers' contracts will be sold by the E.H.F.A. to local banks with the understanding that the R.F.C. will take this paper back on short notice.

Plans call for equipment to sell at the "lowest price ever quoted." Overtures already have been made to interest manufacturers in producing low-cost appliances, these to receive Bureau of Standards inspection for quality.

Operations for the present will be limited to Alabama, Georgia, Virginia, Mississippi, Tennessee, Kentucky and North Carolina which in 1932 had 1,192,626 electric customers (Bureau of Census, 1933). A Tennessee Valley Authority market study reports prospective annual sale in this area for 100,000 electric refrigerators, 60,000 electric ranges and 25,000 electric water heaters.

IT would appear that the E.H.F.A. program ignores a few basic facts—for example, that five of the seven states in which it is to be launched are already well above the national average in per customer usage of electricity. Notwithstanding, markets must be built for Muscle Shoals power.

Will this same attitude be taken in other sections where government power goes begging for lack of markets?

Since the T.V.A. apparently has succeeded in making the electric utilities a party to the financing plan effective opposition may hardly be expected from this quarter. Government backing for low-cost electric appliances will represent vicious competition for the gas man, and beating down of electric rates by T.V.A. will

damage gas rate structures—even though the electric companies be rendered bankrupt in the process.

The Tennessee Valley experiment is proving costly to the utility industry, gas and electric, of that important area. But at least there exists the hope that it will stir the country's utilities and all related interests to a point where they will openly, unceasingly oppose further government encroachment.

## Utility Investors Organize to Oppose Depression in Values

WITH commendable promptness the New Deal has been directed at the plight of the farmer, of the laborer in industry, of the small industrialist—of depressed classes in many levels of the economic structure. Ways and means chosen to rehabilitate the benefiting classes have been questioned at times, but never the underlying purpose of seeking out the "forgotten man" and reestablishing him in his economic station.

But the national recovery prospectus has omitted one large group, made up of investors in the nation's public utilities. Some 10 million of these investors have seen the values of their holdings forced down, in the face of rising prices for general industrial investments; they feel that they can qualify as "forgotten men" under the New Deal. Formation last month of the American Federation of Utility Investors, Inc., a non-profit organization with avowed purpose of opposing the forces that are depressing the fair value of utility securities, therefore brings no surprise.

In its organization announcement the Federation states some pertinent facts:

—that the 28 billion dollar utility industry is owned in small blocks by millions of work-a-day American citizens; average holdings by all utility securities owners, except insurance companies, come to less than $2,500 per capita, even at par value.

—that the welfare of the utilities concerns not only these small holders of direct ownership; it also concerns the financial well being of insurance companies, with their 65 million policy holders and nearly 2 billion dollars invested in utility securities; likewise of savings banks, which have 600 million dollars of the money placed with them by 12 million depositors, invested in utility bonds; similarly, orphanages, hospitals, colleges, church societies, and organizations of like character have large holdings in utilities.

The Federation calls attention to the following political activities which have operated to depress value of utility securities:

1. Unwarranted rate reductions, enacted or proposed by various states and municipalities.

2. Discriminatory taxation, of which the 3 per cent federal levy on sale of electricity is an example (the only sales tax which the producer is forced by legislation to pay and is not permitted to include in his sales price).

3. Threatened government competition with privately owned utilities through development of additional service facilities with taxpayers' money. In this class the Tennessee Valley Authority is an outstanding example.

4. Duplication of existing utility facilities by municipalities—with federal financing through the Public Works Administration. This financing extends a 30 per cent donation and a long-term loan for the remaining 70 per cent at interest rates lower than those available in the open market.

These factors, says the Federation announcement, have operated to lower the price of listed utilities stocks more than 19 per cent during the past year of general recovery—a period in which average prices of listed railroad and industrial company stock gained more than 60 per cent.

An advisory committee of 71 members drawn from most lines of business except the utility industry and investment banking, has been formed by the Federation. Headquarters will be in Chicago, 203 North Wabash Ave. Its announced appeal will be to the great mass of small utility investors rather than to a few wealthy individuals. The Federation declares that no officer or director is engaged in utility operation or management, and that it has no affiliation with utility managements or alliances political or otherwise which might hinder its freedom of action.

Members of the organizing group of the Federation are themselves either large holders of utility securities or are responsible for the management of them in a fiduciary capacity. Its officers are:

Chester D. Tripp, consulting engineer, Chicago, president; Benjamin F. Castle, vice-president of Administration and Research Corporation, investment trust sponsors, New York, and Willard N. Boyden, vice-president of Continental Casualty Company, Chicago, vice-presidents. Clayton J. Howel, founder and retired president of the Orange Crush Co., and chairman of the finance committee of the Northern Baptist Theological Seminary, is executive secretary. J. DeForest Richards, President of the National Boulevard Bank, Chicago, is treasurer.

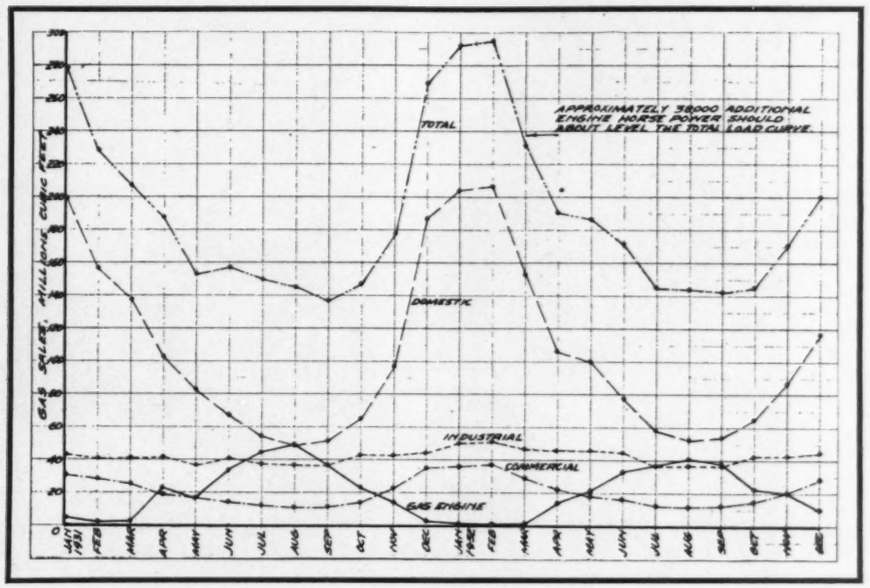
## Utah Rate Classification Supported

FROM J. D. Roberts, vice-president and general-manager of the Utah Gas and Coke Co., Salt Lake City, Utah, we learn of an interesting decision rendered by the Utah Public Utilities Commission on January 12. The plaintiff, a residential consumer, claimed that he should be entitled to the industrial rate extended to apartment houses on the lines of the Wasatch Gas Co. (affiliate of Utah Gas and Coke). Grounds for his claim were that he was using gas for the same purpose as an apartment house, and was using more than the minimum yearly billing under the industrial rates. He was also willing to have domestic consumers take priority over him in the event of gas shortage.

The Commission found that the plaintiff was being served without discrimination as compared with other users in his class but that should his contention be allowed there would be discrimination in his favor as against smaller users, and also in his favor as against industrial users.

Allowance was also given in the Commission's decision to capital investment made by the company in main extensions to serve the area in which the complainant resided, upon which service is still being rendered below cost at present rates.

FIG. 1. Load Curves for a Typical Southern California Agricultural Territory Having All Classes of Load




# Gas Engine Load

# HOW VALUABLE IS IT TO THE GAS COMPANY?

*By* W. M. JACOBS

*General Sales Supervisor*
*Southern California Gas Company*

A GENERAL acceptance of natural gas power in Southern California as a medium of dependable, flexible and economical power has resulted from the pioneering of the sale of gas engines in commercial and industrial fields in this territory over a period of many years. Concurrently, many gas companies have become increasingly aware of the value of gas engine load to their business.

The following analysis endeavors to emphasize the desirable nature of this load to natural gas utilities in general, by outlining some of the characteristic features of this class of business. It should be noted that the conditions outlined are those that exist in Southern California; naturally, such local conditions as the ratio of natural gas and electric energy rates, the nature of the prospective load, etc., will govern the possibilities of building gas engine business in various sections of the country.

### *I. Utility Load Factor Improvement*

Much has been said in recent years to emphasize the chief advantage of gas engine business to gas companies: namely, the beneficial effect on the system load factor. In brief, gas engines are most generally applied to irrigation pumps in agricultural territories, to ice machines in refrigeration plants, or to industrial loads. The first two uses are preponderantly summer loads, and industrial or generating loads are generally of steady operation. It is therefore obvious that the gas engine load will in general tend to fill in the "summer valley" of the typical gas utility load curve.

That this effect may be of appreciable value is evidenced by the graph in Fig. 1, which shows, for a typical Southern California territory having all classes of load, that the engine load peak practically coincides with the bottom of the variable domestic and commercial loads. The addition of some 38,000 horse power of gas engines in this territory would approximately level the total load curve on this chart.

### *II. Permanence of Load*

There are light and heavy duty gas engines sold, both new and used. Sales effort, of course, is generally directed toward the installation of new and heavy duty engines, if justified by the economics of the jobs at hand. Because of the relatively high capital investment in such engines, and due to their dependability and long life, the installations of new, modern, heavy duty gas engines are comparable with domestic load in permanence. Such a machine has a probable life in excess of 20 years. Because of its favorable operating cost, it is not readily replaced by electric power, and while a few modern gas engines are convertible to diesel, the difference in operating cost, if any, favorable to diesel engine power, seldom warrants the conversion to liquid fuel with the attendant change-over cost and sacrifice of the many advantages of gas fuel.

From statistics gathered covering a period of six years in a Southern California territory, the average horse power lost per year was 5.3 per cent of the total connected, and these lost engines operated an average of 5¼ years before being disconnected. A study of these engines individually revealed the fact that practically all of them were either portable or automotive type engines installed temporarily during a prior electric power shortage, or were old liquid fuel type engines which had been converted to natural gas and in most cases had been misapplied. It was evident that very few really natural gas engines of stationary type were replaced by other forms of power during that period. It was also noted that larger engines were more permanent than small sizes, which is logical inasmuch as more of the larger engines sold are of the heavy duty type.

### *III. Financial Stability of Gas Engine Business*

Because of general skepticism which exists concerning the financial "risk" of farmers as a class of customers, and because the bulk of gas engine load in Southern California is agricultural pumping, a study was made to illustrate the comparative capabilities of agricul-

*(Continued on Page 40)*

● The giant suhuaro cactus stands sentinel along Western Gas Co.'s Tucson-Phoenix pipe line right-of-way ●

# *Arizona Extension Market for*

## Pipe Line Construction . . . Change-Over

By George H. Finley

FROM early September, 1933, through early January, 1934, an important chapter was being written into the record of natural gas expansion. With this project—the extension of Western Gas Co.'s transmission system from its former terminus at Douglas, Arizona, to Tucson and Phoenix—another of the country's larger natural gas enterprises rounded out its market, and brought the state of Arizona entirely within the natural gas circle.

Tucson received gas on December 10, Phoenix on January 10. At this writing (January 23) Tucson customers have been changed over to natural gas and the Phoenix change-over is in its last stages. The present article will bring together some facts on the pipe line construction, change-over operations, and load-building programs of the distributing companies at Tucson and Phoenix, on the basis of the writer's interviews with Arizona pipe line and utility officials in January.

First, a brief picture of the Western Gas Co.'s project will be in order.

### *The Pipe Line Project*

Having its origin in the extreme southeastern corner of New Mexico (at Jal in the Lea County field), this pipe line proceeds southwest to provide supply for El Paso, Texas,* continues westerly through southern New Mexico and drops through the southeastern corner of Arizona where Douglas and Bisbee are served. Twenty miles west of Douglas at Monument 90 on the International Boundary an 8-inch line dips 40 miles southwest into the state of Sonora, Mexico, to supply fuel for Cananea Copper Co.'s smelter operations.

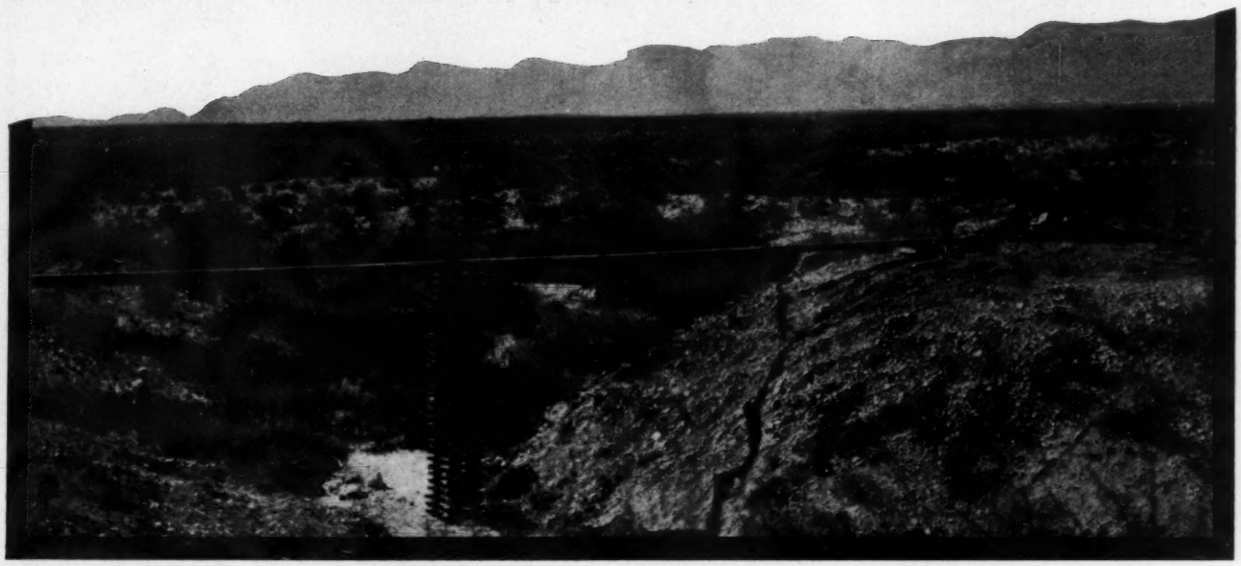
The above sketch covers the first two units in the project, the original 16-inch line from Jal, New Mexico, to El Paso, Texas, being finished about the middle of 1929, and the extension from El Paso to Douglas, Bisbee and Cananea going into service early in June, 1931. This section was 12¾ inches in diameter. Its extension northwest to Tucson and Phoenix brings the major line construction for Western Gas Co. to a period, and future line additions will be those demanded to connect load along the existing route.

*Gas Supply*: Gas supplies for this three-state system have been thoroughly proved and give assurance of many years service. The Lea County field runs 40 miles north and south and 6 miles east and west, reserves being estimated at 3,840,000,000,000 cubic feet. Gas sands are 200 feet in thickness, and the wells produce from a depth of 3500 to 3800 feet. Rock pressure is 1200 to 1500 pounds. A negligible amount of oil is produced in the Jal field, but all of the wells are large gas producers. Of those now connected the larger have open flow of over 100 million cubic feet daily each. Through 50 miles of gathering line 16 wells are now tied onto the line. Twice that number can be hooked on whenever needed.

B.t.u. content of the gas is 1080.

Gas wells are privately owned, among the producing companies being the following: Continental Oil Co., Empire Gas and Fuel Co., Humble Oil and Refining Co., Jal Natural Gas Co., Pueblo Oil Co., Stanolind Oil Co., Texas

*The Jal-to-El Paso section is operated by El Paso Natural Gas Co., parent organization for Western Gas Co.



● Pipeliners negotiated hundreds of these washes through a 70-mile stretch between Douglas and Tucson ●

# *Rounds Out Another Natural Gas*

## Operations ... Load Building Programs

Company and several other interests.

From the gas fields to Phoenix the line runs an overall course of more than 650 miles, made up of these major divisions:

Jal to El Paso—220 miles of 16-inch.
El Paso to Douglas—215 miles of 12¾-inch.
Douglas to Phoenix—216.7 miles of 10-inch.

*Compressor Stations:* Along the first two sections are located four compressor stations. Station No. 1 is 75 miles from the fields in the Guadalupe Mountains. Station No. 2 is in the Huaco Mountains, 70 miles out of El Paso.

At each of the above stations are three 780 h. p. Cooper-Bessemer gas compressors, each with a maximum capacity of one million cubic feet per hour, making a 72 million foot capacity per station, with a discharge pressure of 450 pounds per square inch, which is the working pressure of the Jal-El Paso section.

On the El Paso-to-Douglas section working pressure is 750 pounds. Station No. 3 at El Paso has three 780 h. p. Cooper-Bessemer compressors, station capacity being 42 million feet daily at 750 pounds.

Station No. 4 is at Gage, New Mexico, and consists of two 780 h. p. Cooper-Bessemers discharging at 750 pounds. This unit supplies pressure for the Tucson-Phoenix extension, which will operate at a maximum of 625 pounds.

At the Tucson city gate is a measurement station and laboratory, a similar station being maintained outside of Phoenix. These stations are designed for double regulation, using 3-inch Emco regulators, pilot operated and capable of delivering even pressure in a range from 10 to 100 pounds. On the primary run are a 20-inch and a 100-inch Foxboro orifice meter, and a differential limit controller which controls the measurement in the secondary stage.

Laboratory facilities for making gravity and heat content tests are also maintained at the city gate stations, at each of which are Acme recording gravitometers and Junkers calorimeters. Daily B.t.u. tests are made at each station.

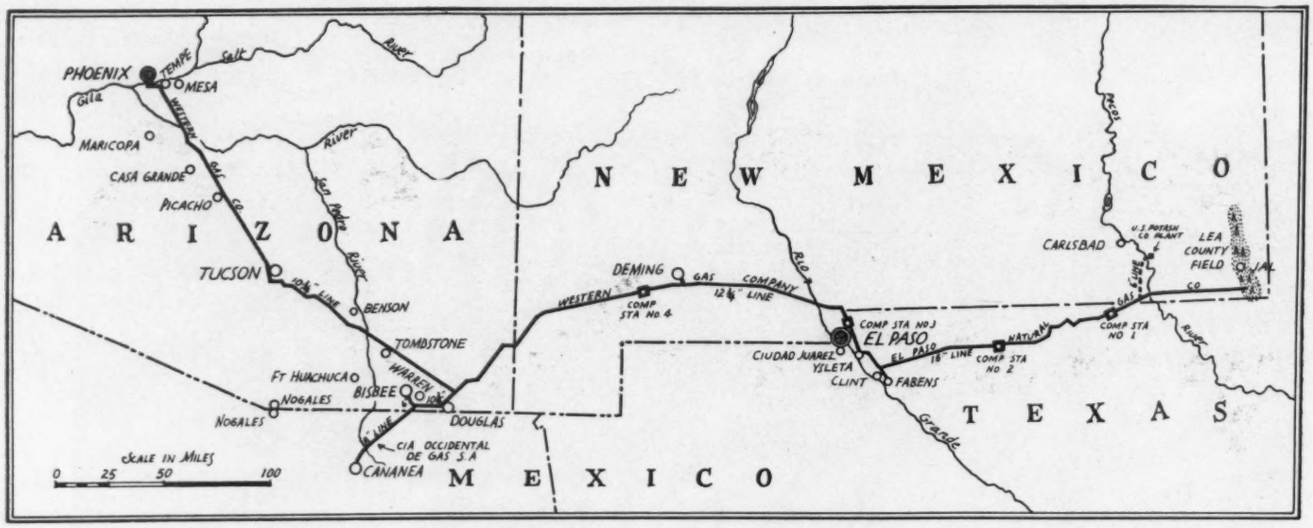
At the Phoenix gate station, located at Guadalupe about 8 miles out of the city, line pressure is reduced to 100 pounds since the territory immediately adjacent to Phoenix is closely settled.

Line dispatching is handled from the Guadalupe and Tucson gate stations. There is no private telephone line between Douglas and Phoenix, though the company has a private system from Jal to El Paso and leased wires from El Paso to Douglas.

### *Construction*

Leaving the main system take-off near Douglas at 622-pound pressure the new line will deliver 15 million cubic feet daily at the Phoenix end, at 100-pound pressure, allowing for a 4½ million take-off at Tucson. By installing a 500 h.p. compressor unit this delivery can be boosted 5 million feet, which will be done if future load should necessitate. There is a possibility of connecting the central Arizona Light & Power Co.'s 18,000 KVA steam plant at some time in the future. This plant only operates as a stand-by when hydro-electric power is shut down, but would call for about 6 million cubic feet of gas daily if it came on the line.

Editor, Western Gas




**The Tucson-Phoenix extension completes a three-state gas transmission system, charted above.**

A joint general contract for the Tucson-Phoenix extension was let by Western Gas Co. to Bechtel Co. and Henry J. Kaiser Co. Republic Steel Corp. furnished pipe for 20 miles of the job, the bulk of the pipe coming from A. O. Smith Corp.

In all, the line called for some 23 million pounds of steel—361 carloads of 10¾-inch O. D. pipe in 40-foot lengths. Wall thickness was .203 inches and weight per foot was 22.866 pounds. The pipe was plain end and beveled 30 degrees for electric welding. Inside chill rings for welding were supplied by the pipe manufacturers.

All-welded construction was followed, electric welding being used throughout.

This pipe line job was a unique problem in one respect in that hand labor was used for every operation to which it could be adapted, to help relieve unemployment conditions existing in the territory traversed. To the same end, no camps were operated on the construction, thus allowing workmen to live at home and giving local business the benefits of money put in circulation by the project. Labor was recruited entirely through various relief agencies, state and federal, some 1200 men being on the payroll at a time employed mostly in the ditching operations. No trenching machines were used on the job, this phase being handled largely by manual labor.

Line right-of-way was cleared with a snow-plow type bulldozer operated by a 75 h.p. diesel engine. Trenches were backfilled with angle-dozers also powered by 75 h.p. diesels.

Rock on the line route was blasted ahead of construction by a rock crew. Tough soil encountered in trenching was broken by plow and scarrifier, and loose dirt was moved from the trench by pick and shovel. Bottoms of trenches were also shaped and graded by hand. Trenches were 20 inches wide by 30 inches deep, giving a 20-inch cover.

Pipe was strung on sub-contract by R. A. Conyes, with specially equipped trucks hauling 26 40-foot joints per load. As many as 17 miles were strung in a day. Pipe was rolled off the trucks by hand along the right-of-way, landing on a buffer made of six old truck tire casings.

A 70-mile stretch between Tucson and Douglas, known as "The Breaks," supplied the toughest going encountered in the extension. This section was severely cut up by erosion and called for a great many spans ranging in width from 30 to 100 feet. On the longer spans cribbing was used for temporary supports during construction, being replaced with permanent A-frames of pipe with concrete footings.

Another special problem occasioned by this rough country was the need for an excessive number of bends. No mitre welds were used in the line, all bends being made cold in the field by tractors equipped with hustlers. Upwards of 10,000 bends were made in this manner.

Several river beds were crossed by the extension, though it was only necessary to use multiple lines in one instance. Two 8-inch lines were laid across the San Pedro River, at St. David. Other crossings included the Santa Cruz, at Tucson, the Gila River—a dry river bed protected by the Coolidge Dam, and the Salt River at Phoenix, also a dry bed, protected by the Roosevelt Dam. River lines were clamped on every 40-foot joint at the dangerous points, with cast iron river clamps weighing 1500 pounds each. Gate valves were spotted on either side of the important crossings.

**Two 8-inch lines were laid across the San Pedro River.**

Three 6-inch Crane-type swing check valves are placed in the line at 70-mile intervals, for emergency shut-off, and gate valves are located every 8 miles. All gate valves and check valves on the Tucson-Phoenix extension are swedged with Venturi nipples to 6-inch.

After being thoroughly cleaned with a W. K. M. outfit the pipe was coated in the field, using Barrett pipe line enamel. Protective methods were designed

for three types of soil conditions, as follows:

Good soil: Cold priming coat and one hot coat of pipe line enamel.

Bad soil (alkali): One cold priming coat and two hot coats of pipe line enamel.

Irrigated districts: One cold priming coat, one hot coat of enamel, and final application of hot coat spiral-wrapped with Johns-Manville asbestos fibre paper. The hot coat and wrapper were applied simultaneously.

Pipe was lined in 200-foot sections on dolleys spotted at 60-foot intervals, and was turned by mechanical means, using an adapter connected to the power take-off of a 30 h.p. Caterpillar tractor.

The following method was introduced for testing effectiveness of pipe coatings, with considerable success. A wire loop encircled the pipe, with wire feelers projecting in the manner of a brush to contact the entire pipe surface. A battery and a spark coil were connected to form a circuit in the event of defective coating, using the pipe as part of the circuit. An open spot in the covering completed the circuit and the unprotected spot could be located by the resulting sparks. These points were then ringed by inspectors and a dauber crew covered the breaks.

The line was tested to 650 pounds over most of the distance. Between Tucson and Phoenix it was tested to 500 pounds. Incidentally, this is one of the few lines where gas test pressure followed close on the heels of the construction crews. Gate valves at 8-mile intervals broke the line into short sections, and gas at test pressure was kept about two sections behind the backfillers.

Markets for gas along this recently completed system are touched upon in the following brief sketch, with reference to both old and new sections of the pipe line.

## *The Market*

Domestic distribution along the line route reaches something less than 40,000 meters, served for the most part by utilities of other ownership than the pipe line company. At El Paso, Texas, the Texas Cities Gas Co. has about 15,000 meters. Douglas, Lowell, Warren, and Bisbee, Arizona, served by Arizona Edison Co., total about 3,000 meters. Tucson Gas, Electric Light and Power Co. has 5,000 gas customers and Central Arizona Light and Power Co. serving Phoenix, Tempe, and adjoining territory, throughout Maricopa County, accounts for another 12,500 active gas meters.

While no communities are served at present enroute to Tucson and Phoenix those which logically may expect natural gas in the future include Casa Grande, Coolidge, Florence, Chandler, Mesa, and Glendale.

Industrial load is the backbone of the El Paso Natural Gas-Western Gas project, which was carried through primarily to bring natural gas to the mining smelters and refineries along the route.

In the El Paso area are such important customers as the Nichols Copper Co., American Smelting & Refining Co., Southwestern Portland Cement Co., El Paso Electric Co., Phelps-Dodge Corp.; and a number of brick yards. Daily load requirements when the industries in the El Paso area are running to capacity would call for 30 million feet.

In this same section some 50 small industrial customers are added to the system by El Paso Gas Utilities Corp., owned by El Paso Natural Gas Co., parent company of Western Gas Co. El Paso Gas Utilities serves the towns of Clint, Ysleta, and Fabens, and an industrial load made up of cotton oil mills and cotton gins.

Among other customers between El Paso and Douglas are the U. S. Detention Farm at Latuna, Texas, and the Deming (New Mexico) Ice and Electric Co. which takes gas for electric generation, there being no gas distribution as yet in Deming.

In the territory centering at Douglas, Arizona, is another 25 million foot daily industrial load under normal conditions, among principal consumers being the copper smelter of Phelps-Dodge Corp., at Douglas and power plants at Lowell and Warren for operation of copper mines and concentrators, and the Paul Lime Quarry at Douglas.

Reached by the extension into Sonora, Mexico, the Cananea Copper Co.'s smelter represents another major load. Its reverberatory furnaces and power plant produce a potential consumption of 4 million feet daily.

A small local distribution system of about 200 meters is operated by Cia. de Gas de Cananea S. A. Cananea is situated on a mountain top 6,000 feet above sea level. There is a 600-foot elevation range in the local distributing system. Gas is sold by the cubic meter to Cananea users, and all computations are on the metric basis.

Gas into Mexico is metered on each side of the international boundary for purposes of import, import duties being paid daily to the Mexican government.

On the Tucson-Phoenix extension considerable industrial and institutional load is also anticipated, this phase of the project being discussed later in connection with load-building plans of the

*(Continued on Page 32)*

**BELOW: Illustrating how "degree day" data were assembled for use by Tucson heating engineers.**

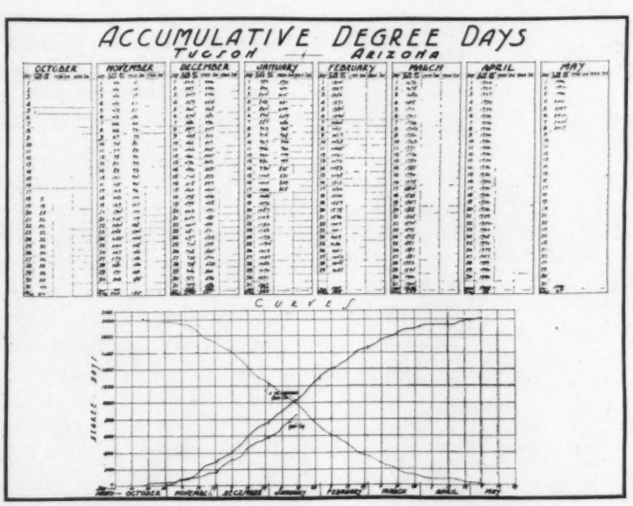


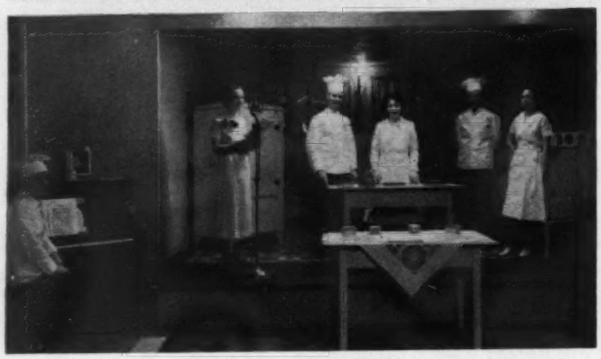

Fig. 1.

MONTHLY FUEL DEMAND PERCENTAGES

Tucson — Arizona

| METER READING DATE / MONTH | 6 | 11 | 16 | 21 | 26 | 31 (LAST OF CALENDAR MONTH) |
|---|---|---|---|---|---|---|
| OCT. | | | | 1.60 | 1.60 | 2.00 |
| NOV. | 2.14 | 3.82 | 5.70 | 9.07 | 11.65 | 13.04 (30) |
| DEC. | 16.66 | 18.00 | 20.97 | 21.41 | 22.85 | 23.50 |
| JAN. | 24.80 | 25.08 | 23.90 | 22.90 | 24.35 | 26.30 |
| FEB. | 25.77 | 24.74 | 24.44 | 24.14 | 20.92 | 17.26 (25-28) |
| MAR. | 16.21 | 16.16 | 14.13 | 13.50 | 11.90 | 12.35 |
| APR. | 10.66 | 8.18 | 6.84 | 3.52 | 4.85 | 4.25 (30) |
| MAY | 3.76 | 4.02 | 4.02 | 3.86 | 1.88 | 1.30 |

Fig. 2.



● **UPPER VIEW: Part of crowd attending The Laclede Gas Light Co.'s home service Thanksgiving table demonstrations.**

**LOWER VIEW: Staff of Laclede's radio home service broadcast. Left to right: E. Boyd, pianist; Rita Ross, announcer; Jack Norman, announcer; Charity Couch, home service director; Leon Archer, singer; Emma Johnson, assistant home service director.**

## In St. Louis

# HOME SERVICE IS ON THE AIR

● By R. D. LEWIS

Director Advertising and Publicity
The Laclede Gas Light Company,
St. Louis, Missouri

THE gas industry, like many others that have been suffering from the economic struggles of the past few years, right now is looking with apprehension at a form of competition that is the greatest challenge since electricity supplanted gas for illumination.

In this particular field sales are no longer to be drawn from greatly expanding markets of virgin users. The battle is more competitive for a greater share of replacement sales in what might be termed saturated markets. It is not any longer just a question of supply and demand, but a question of appealing to an individual in terms of his or her own interest.

The present day housewife is modern. She is brought in closer contact with the outside world through radio and the automobile, and she has time to go places because of labor-saving devices. She is constantly in competition with her neighbors and doesn't want to be left behind. Therefore, she's ready to listen to a new story and may fail to show proper appreciation for a commodity that has been giving satisfactory service for half a century. It requires more than price fixing to combat these threats and for that reason The Laclede Gas Light Co. is coordinating its merchandising plans with promotional activities which are bringing its sales organization in closer touch with the housewife.

Through the cooperation of radio station KSD, owned and operated by the St. Louis Post Dispatch, the Laclede now conducts a home service hour in its basement auditorium with its broadcast direct from the basement each morning from 11:00 to 11:30.

The broadcast and demonstration are made from the stage, constructed in the form of a model kitchen. The program is arranged so that it proves interesting and instructive to those present, as well as to the radio audience. Miss Charity Couch, the Laclede's home service director, and her assistant, Miss Emma Johnson, are in charge of the demonstration, and Miss Rita Ross of the KSD staff is in charge of the radio programs.

The radio programs and the demonstrations are varied from day to day, with some person of wide reputation in the preparation of foods as the guest speaker. One of the most interesting was the preparation of salads by Henry Bausback, chef of the Missouri Pacific Lines. Others included were Mrs. George Meyer, Edwardsville, Ill., well known for her candy and cookie recipes, and chefs from the Park Plaza, Jefferson, Mayfair, Lennox, Chase and Mark Twain hotels.

Women of St. Louis are taking a decided interest in these broadcasts and daily the crowds in the home service auditorium range from 75 to 100. The products of the recipes demonstrated are later displayed in a model kitchen recently constructed in one of the spacious windows of the Laclede Gas Building. This window, 8 by 13 feet, is as modern as tomorrow and was constructed with the cooperation of various firms dealing in kitchen equipment. It consists of porcelain wall cabinets and the latest in floor coverings, walls and lighting equipment. A modern gas range with clock controls and the new air-cooled Electrolux complete the picture. Glistening porcelain tables are used to display products of the KSD programs, such as cakes, cookies, salads and other dainty tidbits.

An information desk has been installed on the main floor where recipes and information concerning the broadcast can be had.

During the pre-holiday season programs with a Christmas touch were prepared. A cookie-baking demonstration also was carried on in advance of the holidays. Young women patrons attracted by the demonstration were encouraged to try their hands at cookie baking and were given three samples of ice-box cookies in glassine bags with the recipes.

John M. Curtin, commercial manager who is directly in charge, is enthusiastic over the results both in actual sales and in the contacts with the customers generally. Many times men accompany their wives to the demonstration. Saturdays are program days and the number of children attending is increasing.

Although considerable attention is being given to the house heating load these days, the gas range is still the backbone of the industry and the Laclede feels it should not be forgotten in our enthusiasm for a new field.

# 1934 Sales Programs *to* Make Heavy Bid *for* Dealer Outlets

DEALER cooperative programs are important features in the set-up of 1934 sales plans, as might be expected from the trend of sales policy during the past three or four years. Increasing the number of active dealer outlets through some system of cooperation which will encourage sale of high quality merchandise, has come to be generally accepted as essential to the load-building scheme.

With the 1934 season the three companies operating in the Los Angeles metropolitan area have extended their dealer cooperative policies in several directions. An excellent summary of these three programs is given in a communication issued to Pacific Coast Gas Association member companies in January by Clifford Johnstone, managing director of the P.C.G.A. Quoting in part from this summary:

"Each of the three companies will employ a number of appliance salesmen who will be available to assist dealers in selling. These salesmen will be paid a salary by the company and will not be permitted to receive remuneration in any form from any dealer. Their assistance will be given only toward the sale of A.G.A. approved appliances of quality.

"In addition the companies will assist the dealer by financing term sales on appliances which are above the accepted standard of quality. Contracts to be financed by the company must be executed on special forms supplied by the company, and upon purchase the company assumes all liability for collection losses. Repossessions will be made by the dealer and delivered to the company for reconditioning. The reconditioned appliance will then be resold to the dealer at an appropriate discount if the dealer so elects.

"The company will reimburse dealers for trade-in allowances made in replacing electric ranges and water heaters. This trade-in allowance will be 35 per cent of the sale price of the gas appliance up to a maximum of $35, toward which the dealer will contribute two-sevenths. The trade-in appliance will be the property of the company. The company will also render a display and copywriting assistance service upon request.

"The above procedure is common to all three companies. There are, however, some variations in detail among which perhaps the most important are as follows:

"The Los Angeles Gas and Electric Corp. does not engage in appliance merchandising itself and for this reason the full time of its salesmen will be devoted to the dealer. The Southern California Gas Co. does engage in merchandising but under the new plan its salesmen will be divided into two groups, the salaried dealer assistance men selling nothing for the compnay, and the company's own merchandising salesmen selling the company's merchandise exclusively. These men, however, may also be paid on a straight salary basis instead of salary and commission as in previous years. The salesmen of the Southern Counties Gas Co. will continue to sell appliances direct for the company in addition to assisting in dealer sales. Salaries will be readjusted every three months on the basis of sales made, equal credit being given for company and dealer sales.

"All three companies will conduct a heavy schedule of load-building advertising in support of dealer sales efforts. The companies concerned wish it understood that these policies are subject to readjustment as experience develops during the year."

Some further detail on type of financing and trade-in assistance offered dealers under the foregoing plans is of interest. In the Southern California Gas Co. statement to dealers, issued last month, are noted these provisions:

Application of the plan is limited to sales in which the appliance is installed on the company's own line.

### *Dealer Financing*

Dealer sales contracts for A.G.A. approved gas ranges, water heaters, and floor furnaces, will be accepted at 95 per cent of the unpaid balance of the contract less the carrying charge, and without recourse upon the dealer, subject to the following conditions which must be met by dealers to secure company financing assistance.

(a) Contracts must be executed upon approved forms furnished by the Company, and be completely and properly filled out.

(b) Contracts must conform to the following terms:

Down Payment—10 per cent or more.

Carrying Charge—On ranges and floor furnaces, 8 per cent per annum upon the unpaid balance; on water heaters, the charge established by the Payment Chart adopted by the Water Heater Division, Manufacturers Section, of the Pacific Coast Gas Association and effective on February 1, 1934. These rates are subject to change after due notice at the option of the company should the latter consider a change necessary to conform with changed trade practices.

Time—12 months upon balances of $100 or less, with a minimum monthly payment of $3, including carrying charges, and 18 months upon balances of more than $100.

(c) Contracts must cover the sale of appliances whose sales price is equal to or greater than those given below: Ranges, $60.00; Water Heaters, $55.00; Floor Furnaces, $55.00. (All prices installed.)

(d) The buyer's credit must be acceptable to the company.

(e) The installation of the appliance sold must be properly made, as evidenced by a report to that effect by a representative of the company.

The dealer will be required to render the usual service upon appliances covered by contracts sold to the company, and will assume all responsibility for the carrying out of the manufacturer's guarantee, replacement of parts, and other service problems.

In the event of repossession and upon request by the company, the dealer will be required to effect the recovery of appliances, and deliver them to the nearest company office or warehouse.

The company reserves the right to refuse to accept contracts from any dealer for due cause.

### *Trade-In Assistance*

Beginning immediately and continuing during the remainder of 1934, the company will assist dealers accepting electric ranges or water heaters as trade-ins on the sale of A.G.A. approved gas ranges or water heaters, respectively, upon the following basis:

The dealer will make a trade-in allowance of not more than 35 per cent, and not exceeding $35 in any case, for the electric range or water heater. Following the installation of the gas range or water heater, the dealer will forward to the company an "Application for Electric Trade-in Refund" upon the form provided by the company.

This claim must give the following information:

Name and address of purchaser.
Make and model of gas appliance sold.
Sale price of gas appliance.
Make and model of electric appliance traded-in.
Trade-in allowance.
Date of sale.
Date of installation.
Name and address of dealer.

Upon confirmation of the sale and trade-in by a representative of the company, the latter will reimburse the dealer for 5/7 of the trade-in allowance made.

Payment of this amount by the company is contingent upon the following conditions:

The electric range or water heater traded-in must be actually owned and in use by the customer at the time of the sale.

The electric range or water heater traded-in must be delivered to the nearest office or warehouse of the company by the dealer, who agrees to transfer his interest and title thereto to the company.

The gas range or water heater must be properly installed as evidenced by a report to that effect by a representative of the company.

*Clock-Controlled Range Promotion*

As a part of the three-company load-building effort in 1934 a two-month concerted sales drive on clock-controlled gas ranges has been organized. Dealers are cooperating, through the following liberal offer from the gas companies: From February 1 to March 31 dealers may sell a clock-controlled gas range made by any one of a number of manufacturers who are cooperating in the promotion, for the same price as the same range would bring without the clock control. This offer will be limited to properly installed ranges with electric clock control, which are A.G.A. approved, and which sell for $89.50 or more after the manufacturer's established retail differential for the clock equipment is deducted from the established retail sales price. However, when a dealer sells a clock-controlled gas range under this plan and thereby replaces an electric range, the trade-in refund previously mentioned will not apply.

Upon making a sale of a clock-controlled range upon the basis mentioned, the dealer will render a report to the manufacturer or distributor from whom he purchased the range.

Following an inspection and satisfactory report on the installation by the gas company's representative, the manufacturer or distributor will credit the dealer with the difference in dealer's cost between the range with the clock control and the same model without.

Several of the larger metropolitan department stores are reported to be selling above 100 clock-controlled ranges a day, during the first days of this campaign.

*L. A. G. and E. Program*

Los Angeles Gas and Electric Corp., which does not merchandise appliances, at the same time time is joining vigorously in the 1934 promotional work in Southern California. The same procedure as to dealer financing and trade-in assistance as previously outlined for Southern California Gas Co. is followed by L. A. G. and E. A number of important departures in sales organization are also reported.

A force of 35 salesmen has been continuously employed in load-building work for the company, under Frank Weiss, manager of new business. However, much of their work was of a non-sales character, and under the 1934 reorganization these duties have been placed in other departments. With about 40 per cent more time at their disposal and supplemented by addition of five men who will sell exclusively for dealers, this force will be actively in the field building gas load during the year.

All salesmen for L. A. G. and E. will sell definite appliances, the sales being routed through dealers. Customers will be asked for their dealer preference or their preference as to make of appliance.

If no preference exists the salesman will then endeavor to bring the customer into one of the numerous display rooms operated by L. A. G. and E. These display rooms are located at the Los Angeles headquarters office, at the Pasadena, Alhambra, Huntington Park, Inglewood, Hollywood district offices, and at numerous branch offices. Space in each display room is made available to local dealers for exhibiting A.G.A.-approved high quality lines.

Where customers cannot be brought into display rooms to select merchandise the salesmen endeavor to close a sale on a definite line of equipment by using sales literature, and then route the sale to local dealers.

All salesmen are on straight salary, and every precaution is taken to prevent their accepting any form of compensation from dealers. For so doing the salesman will be summarily discharged, and the offending dealer will be denied further company cooperation.

A thorough system has been worked up to develop sales leads from non-sales employees, particularly those of the gas distribution department. Some 250 men from this department are being schooled to look for sales leads in their daily contacts with customers and are trained to make a definite sales talk while adjusting appliances at homes where replacements are seen to be desirable.

Appliance prospect cards are filled out by these distribution department field men. Within the same department a special crew of eight men has been schooled both on equipment and sales practice. This crew follows up the field force's leads, culls the "suspects" from the prospects, and all of the prospect cards then go to the new business department. Prospects are worked by the sales force immediately; "suspects" are followed up later as the work schedule permits.

Originals of the prospect cards are numbered and held in the new business department file for a complete check on the sales force. A prompt report of results is made to the employee turning in the original lead. No bonuses are allowed for sales tips but close records are kept by department heads of leads turned in.

Other productive sources of leads are the display rooms, mentioned above. Floor attendants at these points secure names of interested prospects and can readily rank them as to their saleability.

Leads from either of the above two sources are worked upon directly by the company's sales force or turned to dealers where customers express dealer preferences.

The company's 350,000 meter system under the new set-up has been divided into four sections, each in charge of a supervisor. In turn these four major districts are sub-divided into 30 small districts. For dealer contact purposes one of these districts is assigned to an individual company salesman, thus making a very flexible agency for maintaining regular touch with L. A. G. and E. dealers. Any materials or information which the company desires to place in the dealers' hands, if issued to salesmen as late as four o'clock in the afternoon, will be personally delivered to every dealer by 10 o'clock the next morning.

As a part of the new set-up a strong advertising program is being built up and dealer tie-in advertising is encouraged by every means possible. The company has employed advertising talent to prepare copy and publicity, advance copy of all company advertising being taken regularly to the dealers by salesmen who endeavor to induce them to tie-in.

Free window displays and advertising copy assistance will be rendered dealers who desire it.

Home economics copy is also being prepared by a competent woman employed for the purpose and is circulating to a list of 50 newspapers.

Cooking schools will also have a prominent place in the 1934 program. A minimum of 40 schools, three days each, will be given this year by the company, in many cases through cooperation with newspapers. In addition a home economist will be furnished and door prizes and equipment provided for independent schools where requested. For the most part the schools will be staged in theatres where ample seating capacity may be had. No commercialization of

*(Continued on Page 41)*

# Pacific Coast Gas Association

Managing Director: Clifford Johnstone
Association Headquarters:
447 Sutter Street, San Francisco

President: George P. Egleston
General Manager, H. R. Basford Co.,
San Francisco


# Master Plumbers and Gas Utilities Agree on Trade Practices

FOLLOWING discussion extending over a period of several months a joint committee of the California Master Plumbers Association and the Pacific Coast Gas Association has completed an agreement covering trade relations between gas utility companies operating in California and the Master Plumbers Association. A definite set of trade practices has been developed and approved by the joint committee, and will be submitted for ratification at the annual convention of the Master Plumbers Association next May. Following is the full text of the agreement:

### PREAMBLE

In the interests of better service to the public, and recognizing the constant need on the part of the gas utility companies to maintain and increase their loads, and realizing the resulting necessity for their taking a prominent place in the stimulation of markets for gas utilizing appliances, and believing that the master plumbers of the State of California, through their State Master Plumbers Association, can be of inestimable assistance in this work, to the furtherance of mutual interests and to their own immediate profit, the following is adopted as a

### CODE OF FAIR TRADE PRACTICES

### SALES

(1) the gas utility companies will continue their present policy of refusing to sell gas utilizing appliances to their employees except for their own personal use and then only at such prices as do not work a hardship on dealers handling similar appliances, reserving the right, however, to make such prices to their employees on distinctly promotional appliances as may be deemed necessary to introduce such appliances and to build for them an ultimate public acceptance. It is urged that gas utility companies give serious consideration to the more extensive use of affidavits in connection with such employee sales, as a further safeguard against possible abuse of this purchasing privilege.

(2) Retail prices shall be strictly maintained in accordance with the accepted general sales prices prevailing at the time and in the locality affected.

(3) The use of unfair sales arguments, or of sales arguments derogatory or untrue regarding appliances offered for sale through other channels, is strictly prohibited, and disregard of this rule should be summarily dealt with.

(4) The making of impractical installment sales and the granting of abnormally extended terms and excessive trade-in allowances are prohibited.

(5) After a sales policy has been declared and put into effect it shall not be radically changed, except as an emergency measure, without the proposed change first being made the subject of a conference between the parties hereto who may be affected. By this means a feeling of mutual confidence will be engendered and maintained, but this clause must not be interpreted as granting to any party the right to dictate in any way the sales policies of any of the other parties hereto.

### SERVICE

The extent of the service to be rendered to their consumers by the gas utility companies is clearly set forth in the Gas Service Bulletin, (Third Edition), of the Railroad Commission of the State of California, from page 55 of which is quoted the following:

> "The mere fact that the consumer has complained of poor gas service indicates that something is wrong and requires a visit from the service man. As the service man must make the trip it is good business for the utility to instruct him to do everything that he reasonably can to satisfy the customer while he is on the ground and if this necessitates the adjustment of an appliance or the clearing of a house line of naphthalene or water, such work should be done free of charge. If, however, in order to remedy a faulty condition, it would be necessary to do extensive work in changing house piping or repairing appliances, the service man should advise the consumer to this effect so that he may know where the trouble lies and either call a plumber or an appliance dealer."

While this clearly establishes the requirements pertaining to the free service to be rendered by the gas utility companies, it is recommended that this service requirement be confined, to as great an extent as possible, to emergency work and work of a minor nature, and that in all instances where a preliminary survey indicates requirement for extensive use of labor or material the consumer be so advised and a recommendation be made that he call in his plumber to do the necessary work.

### NEW LINE EXTENSIONS

The Railroad Commission of the State of California has laid down certain definite rules, only under which the gas utility companies may extend their gas service lines into new territory. These rules make necessary, in practically all cases, a complete business survey of the territory proposed to be served and the signing up of sufficient new business to meet the requirements of the Commission rules. It is believed, however, that the plumbing trade may be of great assistance in building up this required load and it is strongly urged that they be notified as early as possible of all such contemplated extensions and that they be given every opportunity to participate in the sale of gas utilizing appliances in connection with such extensions.

### LOCAL CONFERENCES

Because of conditions peculiar to the territories served by the several gas companies and in some instances to the several territories served by the same gas utility company, problems of a purely local nature will arise from time to time. All such local difficulties shall be made the subjects of local conferences between the parties hereto who may be affected, to the end that amicable and satisfactory conclusions may be locally arrived at.

Should the difficulty be of such nature, however, that it cannot be composed through the medium of local conferences it shall be referred to the Joint Steering Committee, hereinafter provided for, for consideration and final decision.

### JOINT STEERING COMMITTEE

There shall be appointed forthwith a committee to be known as the Joint Steering Committee, to consist of ten members, of whom five shall be representatives of the State Master Plumbers Association and five shall be representatives of the gas utility companies operating in California.

In order that this committee may function as economically and as conveniently as possible it is recommended that appointments be divided between Northern and Southern California.

This committee shall hold two regular meetings during each year of which one shall be held at the time and in the locality of the midwinter session of the State Executive Board of the State Master Plumbers Association, and the other shall be held at the time and in the locality of the annual convention of the Pacific Coast Gas Association, provided, however, that in the event of such convention being held outside of the State of California the time and place of such regular meeting shall be determined by the Joint Steering Committee.

In addition to the two regular meetings above provided for, this committee shall hold such other meetings from time to time as may be found expedient or necessary, to discuss matters of mutual interest and of benefit to the gas industry in California.

To this committee shall be referred all matters of a controversial nature between the parties hereto, the satisfactory solutions of which cannot be determined by means of local conferences, and the decisions of this committee shall be final and binding upon all parties to this agreement.

Pending such reference to and decision by the Joint Steering Committee, and in order that the confidence of the buying public may not be further weakened by evidences of disagreement in the industry itself, no step shall be taken nor action initiated by any

party to this agreement detrimental to any of the other parties hereto.

To the Joint Steering Committee shall also be referred all matters of legislation affecting the health and safety of the general public, as well as all matters tending to promote or harm the interests of the gas industry as a whole.

GENERAL

All of the conditions set forth in this agreement shall be equally binding upon all parties hereto, it being the sense of this agreement that by these means a feeling of confidence and security may best be engendered and sustained and the interests of the entire gas industry and of the parties hereto, severally and collectively, and of the public, may best be served.

None of the parties hereto shall be bound by this agreement unless and until all of the other parties have demonstrated not only their willingness but also their ability to make fully effective all of the conditions hereof.

This agreement shall remain in full force and effect from and after the date hereof and until March 1, 1935, unless cancelled prior to that date by a notice in writing given by any party to the other parties at least ten days prior to the date at which cancellation is to become effective.

Approved and accepted at San Francisco, California, this 19th day of January, 1934.

*For and on behalf of*
*State Association of Master Plumbers of California:*

R. W. Timmons
J. Hokom
Wm. Nies
L. J. Kruse
Chas. M. Swinnerton, Nat'l Director

*For and on behalf of*
*The Gas Utility Companies Operating in California:*

F. H. Bivens
R. E. Fisher
F. M. Banks

Approved, January 20, 1934.

*Executive Board,*
*State Association of Master Plumbers of California:*

R. W. Timmons, President
F. C. Schilling, Jr., Vice President
J. V. Young, Acting Secretary
J. B. Hawley, Treasurer
J. F. Dickinson
Wm. Nies
W. F. Picard
Chas. M. Swinnerton, Nat'l Director.

## New Publications Received

Transaction, 1929-1930, of the Institution of Gas Engineers of Great Britain.

Viscosity of Natural Gas. Technical Paper No. 555, U. S. Bureau of Mines, by W. B. Berwald and T. W. Johnson.

Trade Association Statistics and the Administration of Codes. U. S. Chamber of Commerce.

Competition with Coal for Commercial Cooking. A. G. A. Industrial Service Letter No. 16.

Meeting Oil Competition in Commercial Kitchens, Supplement to A. G. A. Industrial Service Letter No. 9.

American Standard Approval Requirements (effective June 1, 1934) for Hot Plates and Laundry Stoves, Gas Water Heaters, Gas Ranges, Gas Space Heaters, and Draft Hoods.

## Commercial and Advertising Sessions March 29-30

PIERRE VINET, general chairman of the Commercial Section, and Douglas Buckler, general chairman of the Publicity and Advertising Section, have announced that these Sections will join in a Spring Conference to be held on March 29 and 30 in Los Angeles.

The purpose of the conference will be to discuss preliminary reports from committee chairmen, and other timely subjects having a bearing on load building and business promotion. The 1934 sales and advertising plans will be studied with reference to their effectiveness under present business conditions.

### 1934 Calendar

**February**

*Eastern Natural Gas Regional Sales Conference (A.G.A.)*—William Penn Hotel, Pittsburgh, Pa., February 8-9.

*8th Mid-West Regional Gas Sales Conference (A. G. A.)* — Hotel Sherman, Chicago, Ill., February 15-16.

*Southern California Meter Association*—Los Angeles, Calif., February 22.

**March**

*Oklahoma Utilities Association*—16th Annual Convention, Tulsa, Okla., March 6-7.

*Southern Gas Association, Southern Regional Sales Conference (A.G.A.) and Southwestern Regional Sales Conference (A.G.A.)* — Joint Meeting, Memphis, Tenn., March 21-23.

*Pacific Coast Gas Association, Technical Section*—Annual Spring Conference, Los Angeles, Calif., March 22-23.

*Pacific Coast Gas Association, Commercial Section, and Publicity and Advertising Section*—Joint Spring Conference, Los Angeles, Calif., March 29-30.

**April**

*Mid-West Gas Association* — Sioux City, Iowa, April 16-18.

*Missouri Association of Public Utilities*—Annual Convention, The Elms Hotel, Excelsior Springs, Mo., April 19-20.

*Southwestern Gas Measurement Short Course*—University of Oklahoma, Norman, Okla., April 24-26.

**May**

*Natural Gasoline Association of America*—Tulsa, Okla., May 9-11.

*International Petroleum Exposition* —Tulsa, Okla., May 12-19.

**June**

*Canadian Gas Association*—27th Annual Convention, Windsor Hotel, Montreal, Canada, June 4-5.

**October**

*American Gas Association* — 16th Annual Convention, Atlantic City, N. J., Week of October 29.

As already announced the Technical Section will hold its Spring Conference in Los Angeles on March 22 and 23.

### H. L. Farrar Heads Coast Counties Gas and Electric Co.

H. L. FARRAR was elected president of the Coast Counties Gas and Electric Co. at a meeting of the board of directors held on January 5 in San Francisco. Mr. Farrar succeeds J. B. Wilson, who has been president of the company for the past five years and recently resigned to assume new duties in the middle west.

*H. L. Farrar*

In addition to his election as president of Coast Counties Gas and Electric Co. Mr. Farrar was appointed general manager of the Coast Counties Gas and Electric Co., the Natural Gas Corp. of California and West Side Natural Gas Co.

Mr. Farrar first came to the Pacific Coast in 1931 to join the staff of the Standard Management and Operating Corp. Immediately preceding this he was for a number of years connected with the Western United Gas and Electric Co. and affiliated organizations, making his headquarters at Aurora and Geneva, Ill. For more than two years he has been vice-president of the Coast Counties Gas and Electric Co., the Natural Gas Corp. of California and West Side Natural Gas Co., being actively engaged in their operation and management. He will continue to maintain his offices in San Francisco, but plans to spend considerable time at Santa Cruz and in the territories served by the three operating companies.

The general offices of these companies will remain in Santa Cruz and the department heads will continue to maintain their headquarters there. These include A. E. Strong, general superintendent; R. N. Dreiman, general auditor; H. W. Edmund, sales manager, and Charles Grunsky, chief engineer.

### J. M. Bourus Made General Auditor of San Diego Company

Announcement has been made by W. F. Raber, president of the San Diego (Calif.) Consolidated Gas and Electric Co., of the appointment of J. M. Bourus to the post of general auditor for the company. Mr. Bourus came to the San Diego Consolidated Gas and Electric Co. in 1918 as a clerk in the accounting department, after eight years service with the Oklahoma Gas and Electric Co. Mr. Bourus was recently elected assistant treasurer of the Consolidated Gas and Electric Co., which office he will continue to hold.

### Pipe Lines Made Common Carriers

The Washington state legislature last month passed a bill declaring oil and gas pipe lines in the state common carriers.

MEASUREMENT and CONTROL

# An Integrating Orifice Meter With Electric or Gas Driven Clock

By A. W. DECKER

*Sales Engineer, Pacific Meter Works, American Meter Company**

THE Metric Integrating Orifice Meter is the well-known Westcott Orifice Meter equipped with an integrator which gives a totalized indication of the quantity which has passed through the orifice for all rates of flow or variations in pressure.

The operation of the integrator is continuous. It automatically gives a visible total on the index once a minute. All functions are performed mechanically by special gears. Therefore, there is no necessity for allowing for slippage. The chart continues to give a permanent hourly record for analysis and future reference.

*A. W. Decker*

This integrator extracts the square root of the differential each minute and multiplies the square root of the differential by the square root of the absolute pressure. The sum of the products is continuously totalized on the index. The difference between the readings obtained at the end and at the beginning of an interval multiplied by the meter constant gives the quantity which passed through the orifice during the interval, the meter constant being the unit hourly coefficient of the orifice.

At the maximum readings for differential and pressure, the integration takes place during 300 degrees of the arc of a complete revolution of the cam. At 1 per cent of the maximum reading, the integration takes place during 30 degrees of a revolution.

The scale divisions of the integrator for the differential readings and pressure readings vary according to the square root values. In all cases the pressure pen is set so that the zero reading is zero pounds absolute and the reading for line 10 of the scale is the maximum range of the spring in pounds absolute. For instance, the check reading for line 10 for a 100-lb. spring is 85.34 pounds gage or 100 pounds absolute when the atmospheric pressure is 14.66.

Either type of chart may be used with this instrument—the customary chart which contains a record of the differential in inches of water and the pressure in pounds per square inch gage, or the L-10 chart which is graduated in the square root of 100.

The operation of the integrating mechanism is as follows (see Fig. 1):

The differential cylinder is resolved once every minute by a clock. The differential cylinder has a cylindrical raised surface which is called the cam. As the cylinder revolves in a counter clockwise direction, the cam forces the point of the differential arm to the front of the instrument, which causes the top of the rocker lever on which the scale is mounted to move to the front. Since the rocker lever moves about a shaft as the center the horizontal portion of this rocker lever is raised so that special gears mesh with the gears of the pressure cylinder and rotate same. When these special gears are in mesh the revolution of the differential cylinder will cause a revolution of the pressure cylinder. Therefore, the amount that the pressure cylinder revolves depends upon the surface length of the arc on the cam of the differential cylinder. This cam is of such shape that the length of arc corresponding to any reading is proportional to the reading on the scale and, therefore, proportional to the square root of the differential. A similar rocker lever when it is actuated by the point of the pressure arm and a similar cam surface on the pressure cylinder, causes special gears to mesh and they in turn revolve other gears which are connected to the index counter.

The Metric Integrating Flowmeter is similar to the Metric Integrating Orifice Meter with the exception that the pressure cylinder is omitted. It can be used for the measurement of gas or steam at constant pressure or for the measurement of liquids such as oil, water, etc. These instruments are now made with differential ranges as follows: 0 to 100 inches; 0 to 50 inches; 0 to 20 inches; 0 to 10 inches; and 0 to 2½ inches.

The power is supplied by a Warren Electric Telechron Clock. (See Fig. 2.) Since there are numerous meter settings in the natural gas fields where electric current is not available except at a prohibitive cost, the integrator can be supplied with a gas motor which will drive the integrating mechanism and chart by air pressure or gas pressure. There are also numerous industries which generate their own power, but are unable to maintain the frequency of the current which they generate within close limits due to variations in load factor.

The Metric gas-driven motor, which is gov-

*Presented before the Southern California Meter Association, October 26, 1933.

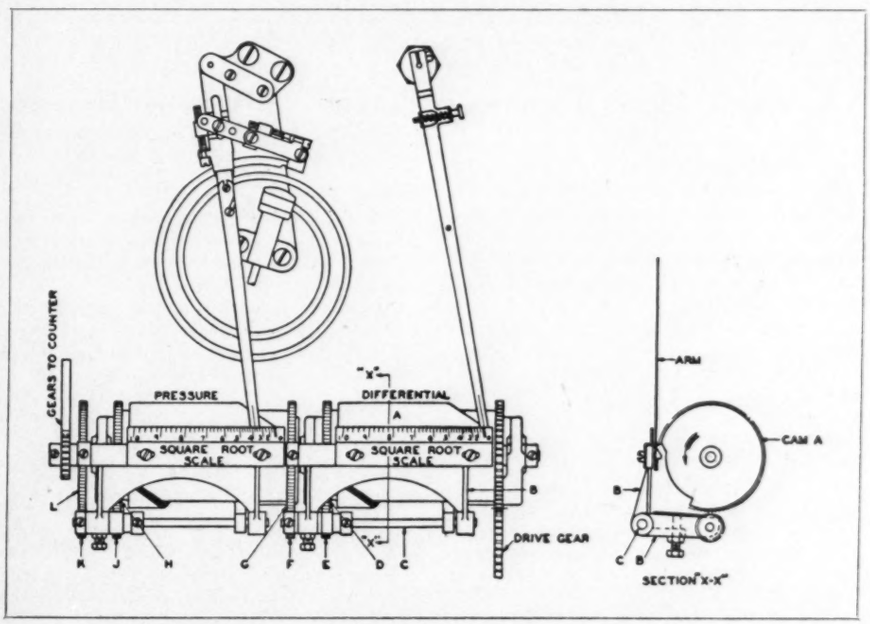



*Fig. 1. Integrating mechanism.*

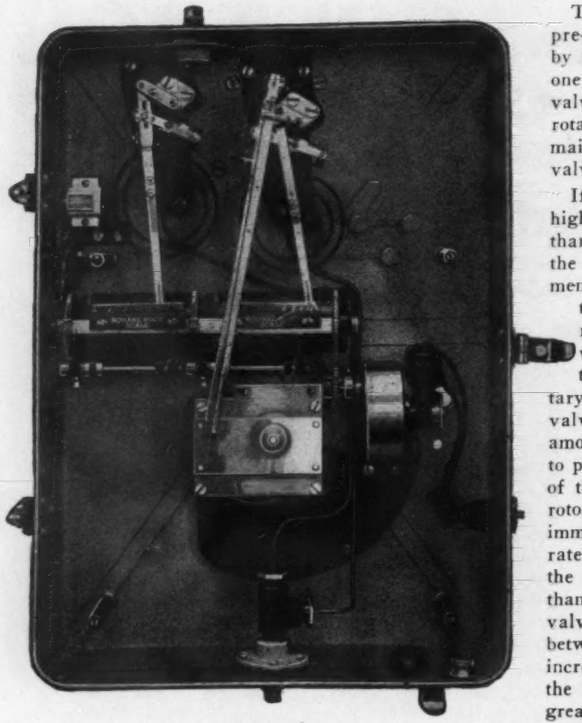


*Fig. 2.*

erned accurately according to time, is operated by a constant pressure between 15 and 40 pounds. It consumes but 250 cubic feet of free gas every 24 hours. A pressure reducing valve reduces line pressures of 75 or 100 pounds to a lower value. Where the line pressure exceeds 100 pounds gage, an additional reducing valve should be installed.

This motor consists of a small rotor which is turned by the velocity of a jet of gas discharged from a nozzle. The velocity of the gas is governed by the opening in a rotary valve through which it passes. The action of the motor is as follows:

The valve is rotated at a constant pre-determined speed which is fixed by the escapement, in this instance one revolution per minute. The valve seat driven by the rotor must rotate at the speed required to maintain a definite opening of valve for any definite inlet pressure.

If the speed of the rotor is too high the valve seat is rotated faster than the valve since the rotation of the valve is governed by the escapement. When the valve seat is rotated faster than the valve, the relative motion between the valve seat and valve decreases the effective opening of the rotary valve. As a result the rotary valve immediately throttles the amount of gas which it will allow to pass. This decreases the velocity of the jet of gas impinging on the rotor and the speed of the rotor is immediatey reduced to the proper rate. Should the rotor be rotating the valve seat at a speed slower than the escapement causes the valve to rotate, this relative motion between the valve seat and valve increases the effective opening of the rotary valve. This permits a greater flow of gas through the rotary valve and consequently an increase in the velocity of the jet of gas impinging on the rotor, thereby increasing the speed to the proper rate. Through a gear train this rotor revolves the seat of a rotary valve and partly winds a coiled spring. One end of this spring is attached to the seat of the rotary valve and the other end of the spring is attached to the valve. The variation between the positions of the valve and seat is definitely limited by a pin in the seat and a slot in the valve. The speed at which this spring may turn the valve is limited by an escapement similar to that used in the ordinary orifice meter clock.

# S. C. M. A. Hears Papers on Butane and Meter Proving

A WELL attended monthly session of the Southern California Meter Association was held January 25 at the Taix French Restaurant in Los Angeles, 55 members and guests being present. President C. B. Heartwell turned the meeting over to F. E. Bradley, program chairman, who first called upon E. L. Roberts, associate professor of physical education at University of Southern California. Mr. Roberts gave a brief talk on the general theme of amateur vs. professional sports.

H. G. Laub of the Southern California Gas Co. next described a new type air and butane mixer which delivers 550 B.t.u. gas. A model of the apparatus was on hand. Mr. Laub's paper appears in this issue. (Page 26.)

"Testing and Proving Displacement Meters in the Field" was the topic of a paper by W. L. Kindred, Southern Counties Gas Co. A new method used by Southern Counties in proving field meters was described by the speaker, whose paper will be published next month.

J. C. Diehl, chief engineer of the American Meter Co., was present at the meeting and added a valuable contribution to the discussion on meter proving.

Following announcement of the Association's regular golf tournament by Gordon Greene, golf committee chairman, President Heartwell declared the meeting adjourned.

## Public Utilities Consolidated Corp. Moves Pocatello Offices

Public Utilities Consolidated Corp., Pocatello, Idaho, has transferred its offices from 145 North Main Street to 213 South Main Street. The new location provides adequate space for the accounting department of the company in addition to display room for appliances.

## Sales Program Outlined at Southern Counties Banquet

Sales personnel, sales management and company executives of Southern Counties Gas Co. met in Los Angeles for an annual sales banquet on January 11. Clyde H. Potter, commercial manager of the company, presided as toastmaster and for the benefit of the sales group outlined the 1934 promotional plans of the company.

Present also at the meeting were F. S. Wade, president of Southern Counties, and F. H. Bivens, vice-president in charge of public relations and sales. In a message to the group Mr. Wade called attention to the excellent progress in sales work during the latter half of 1933, stating that the company's sales definitely turned the corner in August, every month of the year from then on exceeding the corresponding month of 1932 in sales. In December, 1933, Southern Counties had the largest number of active meters in its history, according to Mr. Wade.

## Oil Equip. & Engrg. Exposition To Meet April 16-17 at Houston

April 16-17, 1934 have been selected as dates for the annual Oil Equipment & Engineering Exposition to be held at Convention Hall, Houston, Texas, according to E. G. Lenzner, general manager of the Exposition. Equipment used in drilling, production, refining, pipe lines, gas plants, and marketing divisions of the industry will be on display.

A special section to be devoted to the results of research and experimental work will contain exhibits of the U. S. Bureau of Mines, American Petroleum Institute, the National Safety Council, and universities specializing in petroleum engineering.

## Death of F. D. Shaffer, Pioneer Oklahoma Executive

F. D. Shaffer, aged 64, died suddenly at his home at Lawton, Okla., December 30, after a long period of impaired health. Mr. Shaffer was for many years president of the Chickasha Gas and Electric Co. and became vice-president of the Southwestern Light and Power Co. when the latter company purchased the properties of the former. He retired from active administrative responsibilities about two years ago. Mr. Shaffer was a charter member of the Oklahoma Utilities Association, and for several years a member of its executive committee.

## Newly Formed Eddy County Gas Co. Begins Activities

The Eddy County Gas Co. is laying 20 miles of 6-inch line to supply gas to the U. S. Potash Co. plant six miles south of Carlsbad, New Mexico. This 20 miles of line is from the main line of the El Paso (Texas) Natural Gas Co., of which the recently formed Eddy County Gas Co. is a subsidiary. F. C. Wilson has been named New Mexico agent for the company.

## E. K. Smith Wins Lone Star Promotion

E. K. Smith, formerly assistant foreman of the West Texas district pipe line department of Lone Star Gas Co., Dallas, Texas, has been made foreman. Mr. Smith succeeds Felix E. Byrne, who has left the company.

COMMITTEE:
DOUGLAS BUCKLER...SO. CALIF. GAS CO.
J. EARL JONES.....SEATTLE GAS CO.
A. C. JOY (CHAIRMAN).....P. G. & E.
D. L. SCOTT.....L. A. G. & E. CO.
PIERRE VINET.....C. C. G. & E. CO.

1934 P·C·G·A

HEADQUARTERS:
PACIFIC COAST GAS ASSOCIATION
447 SUTTER STREET, SAN FRANCISCO

GEO. P. EGLESTON, PRESIDENT
CLIFFORD JOHNSTONE, MNG. DIRECTOR

CO-OPERATIVE LOAD-BUILDING MONTHLY NEWS ..... AND VIEWS

# Did you see these Articles by our *News Service*?

**Emphasizing the value of our Coastwide cooperative advertising program is the constant, continuous stream of publicity (featured technical articles) placed by our Technical News Service—a total of more than 150 during 1933. Thirty articles were published in Pacific Coast trade journals in November and December!**

**WESTERN MACHINERY & STEEL WORLD: (1) *Features of Judson Plant, Emeryville, Calif.*—Gas-fired furnace equipment installed by Judson Mfg. Co., leading steel concern, in plant-modernization. ..... (2) *Manufacture of Automobile Tools in Oregon*—Gas-fired heat-treating at plant of P. & C. Hand Forged Tool Co. ..... (3) *Gas Fuel for Heating Rivets for Bridge Caissons*—Specially designed rivet-heaters and gas-fired torches in Bay Bridge construction at Moore Drydocks, Oakland. ..... (4) *Immersion Gas-fired Pasteurizing Tank*—Successful use of immersion gas burners by bottling plants, wineries. ..... (5) *Gas equipment in the Tile Industry*—Four large continuous gas-fired tunnel kilns, Pomona Tile Mfg. Co. ..... (6) *Hamilton Field*—Gas-fired unit heaters installed at Army's newest Air Base, Marin County, Calif.**

**WESTERN FURNITURE RETAILING: (1) *P.C.G.A. Elects George Egleston*—report of 40th Annual Convention, with emphasis on cooperative gas appliance selling in interest of all-gas kitchen. .... (2) *Promotion Possibilities for the All-Gas Kitchen:* Description of A.G.A. Handbook to be used in kitchen-styling services during 1934.**

**KEELER'S PACIFIC HOTEL REVIEW: (1) *New Gas-Heated Deep Fat Fryer*—Description of new immersion fryer for commercial kitchens. ..... (2) *"Savory" Announces New Gas Broiler* — Radiant broiler with automatic heat control. .... (3) *Del Monte Lodge Installs Gas for Heat and Fuel*—25% saving at Del Monte Lodge, Pebble Beach, Calif. ..... (4) *New Garland Range Incorporates Advanced Ideas.***

**PACIFIC DAIRY REVIEW: (1) *Dairymaid Plants Use Gas for Fuel — Steam* boiler equipment in three plants of Dairymaid Creameries Ltd., Oakland, Hughson and Tracy, Calif ..... (2) *Gas Fuel in Milk Plants*—Milk Producers' Ass'n. of Central Calif.**

**WESTERN RESTAURANT: (1) *Coffee Pot Built to Look Like One*—Gas-fired cooking in the "Coffee Pot" restaurant, Tacoma, Wash. ..... (2) *Quality is Aim of Italian Villa*—Gas-fired cooking in Los Angeles restaurant specializing in Latin cuisine.**

**HOTEL NEWS OF WEST: *Success of two Gas-equipped Cafes*—Gas cooking at "Coffee Pot," Tacoma, and "Oasis," Seattle.**

**PACIFIC COAST RECORD: (1) *Latest Equipment at Beverly Hills Hotel*—Gas cooking at luxurious Beverly-Wilshire, Beverly Hills, Calif. ..... (2) *Conventions Boost Casa Business* — Gas-fired cooking at Casa de Manana, La Jolla, Calif. ..... (3) *Air-cooled Electrolux Introduced* — Description of newly-perfected gas refrigerator.**

**PACIFIC COAST CHEF: *Coney Island Sandwich Shops* — Gas-fired cooking in Seattle, Wash.**

**WESTERN HOTEL REPORTER: *Model Kitchen Used Gas-fired Cooking Equipment*—Gas for cleanliness and efficiency in remarkably-equipped kitchen of new Marine Hospital, Seattle, Wash.**

**PACIFIC FACTORY: (1) *Gas-fired Unit Heaters for Industrial Buildings*—three recent installations at Continental Can Co., Oakland; Henderson Bros., Sacramento; General Electric Co., Oakland. ..... (2) *Advances Made in Perfection of Automatic Burner Controls* — Stoker combination control system for gas-fired steam boilers; automatic adjustment of stack and louvres. ..... (3) *Western Concerns Successful in Introducing New Industrial Burners* — Efficient Forster burners. ..... (4) *Natural Gas Used in Large Baking Plant* — Gas-fired equipment for bread, doughnuts, pastries, Los Angeles division of Safeway stores.**

**WESTERN CONFECTIONER: (1) *Boldemann Chocolate Plant Has Gas-fired Boilers*—Rotating Chocolate roasters at San Francisco plant, fired with N.G.E. gas burners. ..... (2) *Triangle Candy Plant at L. A. Gas Operated*—Gas fuel for candy furnaces, batch warmers, and water heating.**

**WESTERN BAKER: *The Robert I. Steel Junior Bakery*—Gas-fired equipment in model Los Angeles plant.**

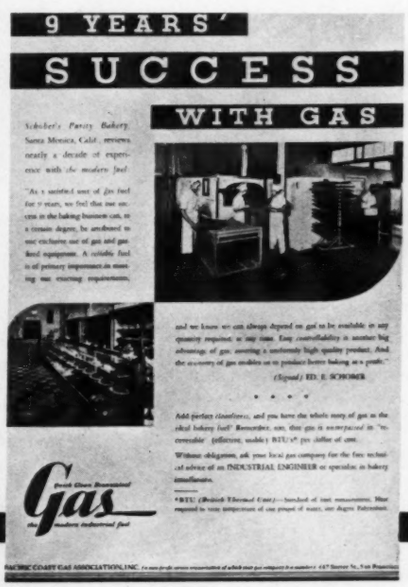
**WESTERN PLUMBING & HEATING JOURNAL: *Gas-fired Water Heating*—Model installation at Palacia Apartments, Hollywood, shows remarkable economy and efficiency.**

HOTEL ST. FRANCIS
"THE ONLY FUEL"
...says T.W. Ireland, Chief Engineer
Hotel St. Francis, San Francisco
An almost "flat" pressure-line ...fuel bills cut 25 per cent ... furnace repairs reduced 75 per cent ... clean stacks and a cleaner building—these are some of the reasons cited by Chief Engineer Ireland for his enthusiastic endorsement of gas.
Lower stack-temperatures, too, mean less heat-wastage. And the fuel is always "on tap"... no storage, no delays, no dirt! "Gas," says Mr. Ireland, "is the *only* fuel."
COMPARE THESE RECORDINGS
From Hotel St. Francis Pressure Gauge
PREVIOUS FUEL
WITH GAS
Gas
the modern fuel
PACIFIC COAST GAS ASSOCIATION, INC.
447 SUTTER STREET, SAN FRANCISCO, CALIFORNIA

## NEW 1934 ADS

***Above***—A remarkable endorsement of gas by the Chief Engineer of one of the West's greatest hotels. (Architects and Engineers' Publications.)

***Below***—Bakery publications carry this testimonial by a prominent Southern California bakery.



# Municipal and Private Rates in Oklahoma

OKLAHOMA Utilities Association, of which E. F. McKay is manager, on January 24 issued a comparison of municipal gas rates with private utility gas rates in Oklahoma. Rates of municipal plants for the first 5,000 cubic feet averaged 50 cents, and private company rates for the same quantity 43.5 cents, a difference of 6.5 cents in favor of the company rate. Below appears the town-by-town tabulation. Comparisons are as of January 1, 1934 and are made between towns of nearest the same populations. The towns served from municipal plants are preceded by an asterisk.

| Town | Population | New Rate in Cents Per M c.f. |
|---|---|---|
| *Castle, Okla. | 283 | 50 |
| Agra | 258 | 58½ |
| *Cleveland | 2959 | (winter) 55 (summer) 60 |
| Chandler | 2717 | 45 |
| *Fairfax | 2134 | 44 |
| Erick | 2231 | 45 |
| *Granite | 1341 | 54 |
| Rush Springs | 1340 | 52 |
| *Kaw City | 1001 | 47 |
| Ringling | 1002 | 45 |
| *Mangum | 4806 | 50 |
| Drumright | 4972 | 39 |
| †*Pawhuska | 5931 | 35 |
| Pawhuska | | 38 |
| *Pryor | 1828 | 60 |
| Quinton | 1804 | 25 |
| *Wann | 168 | 50 |
| Kildare | 160 | 45 |
| *Willow | 347 | 60 |
| Crowder | 340 | 43 |
| *Yeager | 300 | 45 |
| Canadian | 295 | 43 |
| Average municipal rate for first 5000 cubic feet | | 50 cents |
| Average company rate for first 5000 cubic feet | | 43.5 cents |
| Difference in favor of company rate | | 6.5 cents |

* Municipal service.
† City system serves about 10% of customers.

## New Requirements Available From A. G. A. Laboratory

Five additional approval and listing codes were recently approved as American Standards and published in final form. These include:

American Standard Approval Requirements for Gas Ranges, Effective June 1, 1934, Z21.1—1933.

American Standard Approval Requirements for Hot Plates and Laundry Stoves, Effective June 1, 1934, Z21.9—1933.

American Standard Approval Requirements for Gas Water Heaters, Effective July 1, 1934, Z21.10—1933.

American Standard Approval Requirements for Gas Space Heaters, Effective July 1, 1934, Z21.11—1933.

American Standard Listing Requirements for Draft Hoods, Effective July 1, 1934, Z21.12—1933.

Copies of these standards may be secured upon application to the American Gas Association Testing Laboratory, 1032 East 62nd Street, Cleveland, Ohio.

Manufacturers may now have their draft hoods tested for listing in accordance with the above code, or their appliances tested under the revised approval requirements, upon application to the Testing Laboratory.

## Progress Report on Underground Pipe Specimens Issued

IN research paper No. 638 the Bureau of Standards has prepared a report on pipe specimens buried in 1932, representing a progress report on the soil corrosion study launched by the Bureau in 1922. Pipe specimens have been removed, examined and reported upon at approximately two-year intervals since 1922.

The data presented in the latest paper confirm the tentative conclusion previously drawn that soil characteristics are the most important factors in determining underground corrosion. All commonly used ferrous materials corrode similarly underground. Small differences in the behavior of different materials may be noted but they do not appear to be very important and it is difficult to determine whether the observed differences are really significant or only accidental.

All metallic coatings under test appear to have reduced the rates of corrosion of the specimens to which they were applied, but a considerable number of these specimens show rust spots after eight years' exposure to the more corrosive soils.

Copper and alloys high in copper appear to corrode less rapidly than ferrous materials in many if not all soils.

The last of the specimens buried in 1922 will probably be removed in 1934, and a complete report on the investigation will be prepared as soon thereafter as circumstances permit.

## Report on Donations Required of California Utilities

California Railroad Commission recently announced changes in general orders affecting public utilities which have gross annual revenues of $25,000 or more. These utilities are now "required to report to the Railroad Commission in detail, all dues, donations, subscriptions and contributions made by them." The order provides that the reports shall cover such disbursements whether "made or paid directly or indirectly, by increasing employees' salaries to offset such dues, donations, subscriptions and contributions, and the amount of said dues, donations, subscriptions and contributions paid or made to each of said persons, associations, firms or corporations." The order further requires that the utilities shall also report in detail the payments made for legal service, specifying the attorneys to whom the payments shall be made and the amount of such payments.

## Fall Sales Campaign Builds Revenue for Minn. No. Power

Minnesota Northern Power Co. in its recently concluded "Over-the-Top" campaign added some 102,310 M c.f. additional load, representing upwards of $51,000 in estimated annual revenue. The campaign was a notable achievement from a merchandising standpoint, over $100,000 in sales being billed and appliance stocks on hand prior to the campaign being reduced by $20,000.

In line with the custom of the past several years, A. E. Schwarz, commercial manager for Minnesota Northern Power, has prepared a 1934 sales calendar which appropriately visualizes sales events of the year. By the calendar a three-month sales effort on ranges, water heating and refrigeration is due to open in April, and the company's all-employee annual fall campaign is again planned, opening September 1 and extending through November.

## Another National Contest on Gas Refrigerator Sales

The American Gas Association through R. A. Malony, chairman of its refrigeration committee, announces another refrigeration sales contest to be held during April, May and June of this year. A similar contest held last year from July to October, inclusive, with more than 300 companies participating, was reviewed in *Western Gas* for January, 1934. Mr. Malony's committee is ready to provide participating companies with direct mail campaign material on request directed to him at A. G. A. headquarters, 420 Lexington Avenue, New York.

## Within Law to Loan P. W. A. Funds to Private Utilities

In response to an inquiry made at the request of a member company by the American Gas Association the Public Works Administration has stated to the A. G. A.'s Washington representative that it is within the law for money grants to be made to privately owned public utilities, but that up to the date of this statement, January 16, none had been approved. The P.W.A. declined to state whether an application from such source would be approved.

## Right to Use Private Mail Boxes For Bills Is Refused

Postmaster General James A. Farley, on January 6 upheld a recent ruling that individual mail boxes may be used for mail only. In so doing he overruled protests of utility company representatives who were petitioning for permission to continue the practice of using private mail boxes for bill deliveries.

## H. O. Caster to Address Oklahoma Utilities Association

Judge H. O. Caster of New York, member of the Executive Committee of Henry L. Doherty & Co., and president of the American Gas Association, has accepted the invitation of the program committee to attend and address the annual convention of the Oklahoma Utilities Association to be held at the Mayo Hotel, Tulsa, March 6 and 7.

## George H. Cressler Now With Graver Tank & Mfg. Corp.

George H. Cressler, former vice-president and general sales manager of The Stacey Manufacturing Co., and vice-president of the Stacey Brothers Gas Construction Co. of Cincinnati, Ohio, has become a member of the organization of the Graver Tank & Mfg. Corp.

Mr. Cressler was graduated from Yale University, the Sheffield Scientific School, in 1902. From 1902-1914 he was with the Kerr Murray Manufacturing Co., Fort Wayne, Ind., serving as vice-president in charge of sales and engineering from 1910 to 1914.

From 1914 to 1918 he was a member of the firm of Walker & Cressler, consulting engineers, Chicago, specializing in public utility engineering, design and construction.

Following service as a commissioned officer in the Ordinance Department, U. S. Army, he became general sales manager of the Stacey Manufacturing Co., Cincinnati, Ohio, in 1921. In October, 1931, he was also appointed vice-president of the Stacey Manufacturing Co. and of the Stacey Brothers Gas Construction Co. of Cincinnati.

## Ranges Sell Fast in Community and Texas Cities Territory

Community Natural Gas Co., Dallas, Texas, in a 30-day gas range campaign ending in December, 1933, reports a total sale of 442 ranges. During the same period Texas Cities Gas Co., another Lone Star unit, sold 73 ranges, raising the total for the two groups to 515. During the sale range stocks were depleted and many orders were billed for later delivery. Almost 100 per cent of the ranges were sold fully insulated, with oven heat control, and porcelain lined.

To indicate the rate at which Community Natural divisions sold ranges during this period, in the Handley division George Gott, manager, with the assistance of one salesman, the cashier and outside service man, sold 36 ranges. In the Clarksville district, which had only 575 meters, F. I. Collie, local manager, himself sold 21 ranges.

## Arvin Gas Permit Asked

Robert L. Stockton, in the name of the Arvin Gas Co., has filed application with the California Railroad Commission to serve gas in the town of Arvin, Kern County, Calif., and to homes and farms adjacent to pipe lines which would be laid from the Mountain View oil fields.

## No Action on Missouri Tax

Senate Bill No. 16, proposing a tax of 5 per cent on gas and electric sales in Missouri, died on the Missouri calendar without action, the legislature adjourning on January 11. The tax would have been assessable upon consumers.

## San Antonio Heating Users Increase

Thirty-eight new heating customers were added to the San Antonio (Texas) Public Service Co. system during 1933. The estimated total increase in gas consumption amounted to 5,685,000 cubic feet.

# Study on Corrosion Due to Hydrogen Sulphide

A NEWLY recognized type of corrosion in natural gas transmission lines where only traces of hydrogen sulphide are present (12 grains or less per hundred cubic feet) has been studied and reported upon by the United States Bureau of Mines.

As a part of this work, Bureau engineers have had under observation a transmission line operating at an average pressure of 300 pounds per square inch, transporting gas that contained 2 grains or less of hydrogen sulphide per hundred cubic feet. Within the last few years several failures have occurred in this line, brought about by the gradual thinning of the walls of the pipe to the point of failure. Reductions of wall thickness, if permitted to continue unobserved with no corrective measures taken before the strength of the metal is reduced below the point of rupture, are likely to be both costly and hazardous, as failure may occur without warning and with explosive violence.

The corrosive effect of hydrogen sulphide on steel and other materials used in the manufacture of oil industry equipment is evident from the annual replacement costs caused by this gas and a great deal of study has been given this problem by many agencies. Heretofore, corrosion by gases containing traces of hydrogen sulphide has been regarded as a particular type of ordinary gaseous corrosion where the subject metal is in an essentially dry condition and the three important factors considered were per cent of hydrogen sulphide in the gas; per cent of oxygen in the gas, and per cent of water vapor in the gas.

After a number of practical field inspections were made by Bureau of Mines engineers, where internal corrosion of transmission lines carrying gases containing only traces of hydrogen sulphide was evident, the data indicated that no serious corrosion could be attributed to the ordinary type of gaseous corrosion. Instead, at seriously corroded areas a perceptible and even considerable quantity of water existed upon the metallic surface during corrosion. The Bureau has designated corrosion in which the subject surface is covered with a sensible film of water, by the term, "modified gaseous corrosion."

The work of the Bureau of Mines on modified gaseous corrosion has been reported in Technical Paper 560, entitled "Corrosion of Steel by Gases Containing Traces of Hydrogen Sulphide; Effect of Pressure and Moisture Conditions." The authors are John M. Devine, C. J. Wilhelm and Ludwig Schmidt.

The test apparatus used by the Bureau engineers is quite simple. The specimens are arranged so that a different gas pressure exists for each specimen. In order to obtain the conditions necessary for modified gaseous corrosion, each specimen is inclosed in a small tight-fitting muslin sack and thoroughly wetted. This provides the necessary film of moisture on the subject surface.

The report also describes a tentative method for the analytical determination of small quantities of hydrogen sulphide gas, the silver sulphate absorption method, based upon the work of Borgstrom and Reid on mercaptans.

Data were obtained on the effect on the corrosion reaction of (1) pressure, (2) humidity conditions, and (3) hydrogen sulphide content of the gas. In studying the humidity relations it was found that in some of the tests the specimens were dry at the end of a test. This condition has been referred to as "variant humidity conditions."

The general results of the study of modified gaseous corrosion as made by the Bureau of Mines are summarized as follows:

Traces of hydrogen sulphide in a gas may cause severe corrosion if oxygen and water are present. Modified gaseous corrosion in which precipitated water is present on the surface of the metal is much more severe than ordinary gaseous corrosion in which no precipitated water is present on the surface of the metal although the gas may be saturated with water vapor. Pressure accelerates the action in both forms of corrosion, but this effect is particularly noticeable in modified gaseous corrosion.

The application of pressure to a gas also may increase the corrosion rate by causing precipitation of moisture on the surface of the metal, thus transforming ordinary gaseous corrosion to modified gaseous corrosion. The corrosion-threshold concentration of hydrogen sulphide, or the amount necessary for producing severe corrosion, is lower for modified gaseous corrosion than for ordinary gaseous corrosion. Modified gaseous corrosion appears to be the result of an electrochemical reaction, while ordinary gaseous corrosion has the characteristics of a chemical attack. The corrosion rate with modified gaseous corrosion increases with a decrease in the thickness of the moisture film on the surface of the metal, but with continued reduction the reaction finally loses its electrochemical character and becomes ordinary gaseous corrosion. Modified gaseous corrosion can occur in the absence of hydrogen sulphide if oxygen is present; such corrosion, also, is accelerated by pressure.

In natural gas pipe line systems, modified gaseous corrosion is the chief consideration in combating corrosion caused by gas containing traces of hydrogen sulphide. Steps that may be taken to reduce corrosion losses in pipe line systems include (1) Removal of hydrogen sulphide from the gas, (2) Reduction of oxygen content of the gas, and (3) Control of humidity condition.

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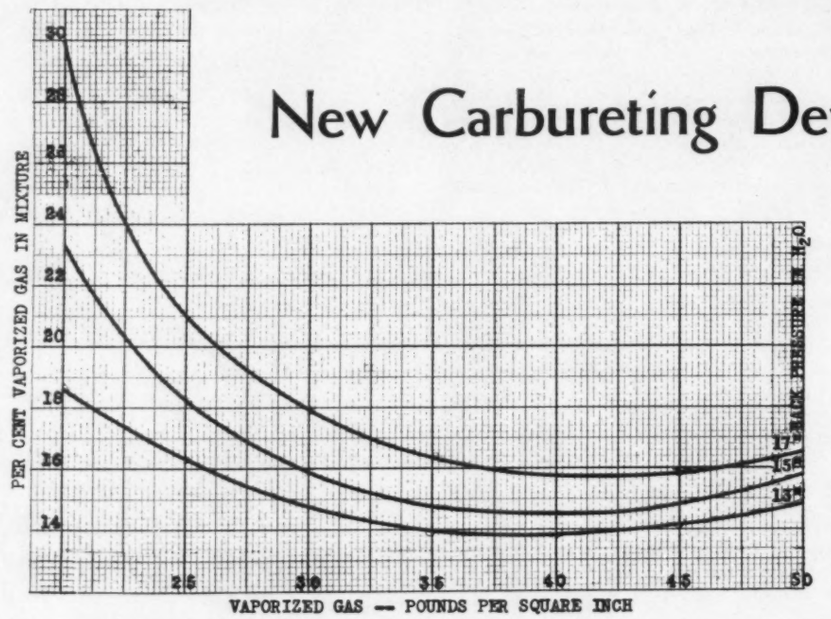
## Modern Appliances, Inc., Formed at Houston, Texas

S. C. Grasinger, formerly sales supervisor for the Dallas (Texas) Gas Co., with J. S. Kendall, former salesman of the same company, have organized Modern Appliances, Inc., with headquarters at 4001 Main Street, Houston, Texas, to handle Electrolux refrigerators and Ruud water heaters in addition to other gas appliances and equipment. A force of 16 salesmen will be employed by the new firm, and a warehouse will be maintained at 329 North Main Street. Mr. Kendall heads the company as president and Mr. Grasinger as vice-president and general manager.

# BUTANE • PROPANE NEWS

Vol. 4, No. 2 February, 1934


PERFORMANCE CURVES FOR "GASAIR" (TYPE S)—AIR TEST AT SEA LEVEL

# New Carbureting Device for Butane-Air Gas


*By* H. G. LAUB

*Southern California Gas Company**


BEFORE starting an explanation of a new type of butane-air mixing device a brief resume of the present day butane-air plant will supply some necessary background.

Heretofore the carbureting devices used have been built on the blower or compressor type. They have for the most part been motivated by electric motors, thereby placing considerable reliance upon the electric companies for continuous gas operation. It has also been found in many instances that the electric energy constitutes too large an element in the operating cost, particularly for small operations. Then, too, to make the present type plant fully automatic a certain amount of delicate equipment is required which has necessitated the employment of skilled labor. This feature hitherto has limited the economic application of butane-air gas to small town operations.

In butane there is considerable energy present because of the pressure generated in the storage tank from atmospheric temperatures. To utilize this developed energy, to lower the cost of carbureting the mixed gas, and to produce a simple, fully automatic, self-contained machine, a device called "Gasair" has been designed.

Two types of the machine have been developed—Type S, which can be made to operate with variations of back pressure as low as ¼ inch water column, and Type T, a less sensitive machine, requiring a back pressure change of 2 inches water column to operate.

Both types are similar, so for the sake of brevity, and for the purpose of this discussion, only Type S will be described.

The "Gasair" consists essentially of three elements, namely, a pilot control mechanism; a vapor pressure regulator, also acting as a shutoff valve; and an inspirator.

The pilot control mechanism is actuated by the pressure in the consumers' gas main and operates the valve in vent and the valve between the pilot chamber and the control chamber. The vapor pressure regulator and control mechanism is subject to pressure of vaporized gas from the butane storage tank and is permitted to function by action of the pilot mechanism. The inspirator consists only of a fixed orifice in a nozzle delivering gas to a venturi, the venturi having incorporated in it an adjustable air check valve, through which is induced the air necessary for mixing.

With the machine connected as shown in the diagrammatic sketches, the operation is as follows:

When the pressure in the consumers' mains drops a predetermined amount, the pilot diaphragm is forced down by its pressure spring. This action closes the valve leading to the control chamber. Further drop in pressure causes the pilot diaphragm to be further depressed, opening the venting valve and venting the pressure sealed in the control diaphragm to the atmosphere. The small amount of gas so vented as a rule is led by tube to the air check valve so that it is sucked into the venturi at once. With the pressure under the control diaphragm entirely reduced, the spring loading acts through the levers opening the vaporized gas valve permitting flow of undiluted raw gas to the fixed orifice in the nozzle. The velocity of the gas through the orifice entrains the air necessary for mixing. The action of the spring loading on the main valve and the regulator diaphragm controls the pressure by which the raw gas reaches the nozzle.

*H. G. Laub*

From the above discussion it is readily noted that the machine either operates at capacity or it does not operate at all. This is very important because should there be any throttling action by the main valve, there would be a resultant change in the velocity of the raw gas through the nozzle and a consequent change in B.t.u. of the finished gas. It is also worthy to note that air enters the machine at atmospheric pressure and is in reality compressed to working pressure in the mains. Successful operation up to 1 pound back pressure has been recorded.

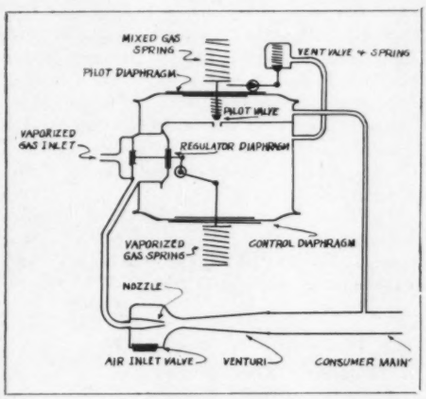
In tests made on the machine, performance curves were obtained as illustrated. These curves are interesting because of their general shape. To obtain these curves, the

*Mr. Laub's discussion was given before the Southern California Meter Association at Los Angeles, Calif., January 25, 1934, under the title "An Air and Butane Mixer to Deliver 550 B.t.u. Gas."

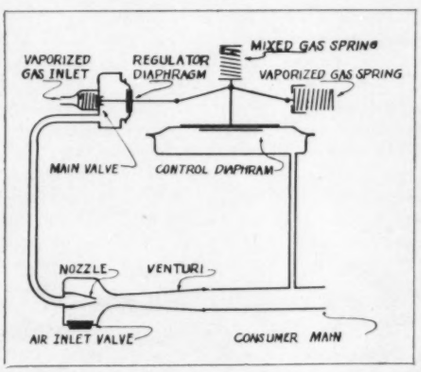
machine was operated with a set back pressure. The pressure of the raw gas was varied and the resultant percentage of raw gas in the mixed gas was obtained. A rapid change in percentage of raw gas will be noted between certain pressure limits, while between other pressure limits the curves flatten out and denote only a very small change in the percentage of raw gas or B.t.u. of the finished gas.

The machines have been operated under working conditions, meeting a varying load, and a uniform gas has been produced as noted by readings taken at varying distances up to a mile from the outlet of the machine.

Because it is known that the machine will work on butane, it is believed that it can be adapted for use as an industrial burner for natural gas. At present however it is not known what effect the specific gravity of natural gas will have on the mixture, since the machine has only been demonstrated on butane having a specific gravity of approximately 1.95. Also, the machine working on butane has operated against a back pressure, while for burner work it would be required to work against zero pressure or in reality a small vacuum.




TYPE S
(Patent Applied For)




TYPE T
(Patent Applied For)

Diagrammatic sketches of "Gasair" carbureting apparatus.

The machine should be of definite service as a repair unit, on natural gas operations. Its small size makes it easy to install in the average regulator vault or bell hole along the pipe line. It can thus be installed readily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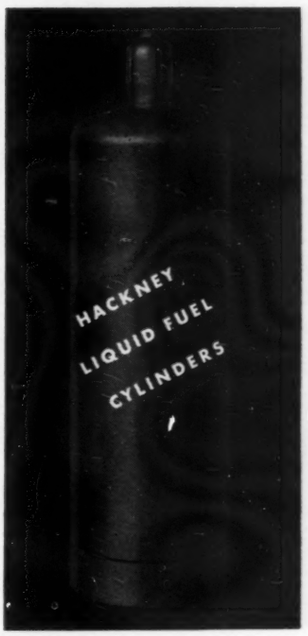


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## Annual Meeting of the National Bottled Gas Association

MARK ANTON was reelected president of the National Bottled Gas Association at its annual meeting held January 24 in New York City. Edward Braen of Braen & Gouchee, Hawthorne, New Jersey, was elected first vice president, with Paul Zook of Sloan & Zook Companies, Kane, Pa., being elected second vice president. Frank H. Fetherston was re-elected secretary and treasurer.

*Mark Anton*

The following were selected by the Association as directors:

William H. Tompkins, William H. Tompkins, Inc., East Williston, L. I.; Walter F. Vercamp, Vercamp Corp., Cincinnati; Louis E. Selikowitz, Conservative Gas Corp., Brooklyn, N. Y.; Frank H. Pope, Fuelite Natural Gas Corp., Waltham, Mass.; M. Hobson, Skelgas Co., Kansas City; A. N. Kerr, Imperial Gas Co., Los Angeles, Calif.; J. E. Balsley, Standard Oil Co. of Calif., San Francisco, Calif.; John L. Locke, Northwestern Blaugas Co., St. Paul, Minn.; Carl Schmidt, Nugas Co., Darien, Conn.; H. Strickler, Protane Corp., Erie, Pa.; Paul Zook, Sloan & Zook Co., Kane, Pa.; H. Emerson Thomas, Philgas Co., New York City; Howard S. Bunn, Pyrofax Division, Carbide & Carbon Chemicals Corp., New York City; Edward Braen, Braen & Gouchee, Hawthorne, New Jersey; A. E. Dauphine, Suburban Gas Corp., Hyannis, Mass.; F. W. Warner, Jr., Superfuels Co., Tampa, Fla.

The day's meeting, attended by approximately 100 members of the industry, was largely given over to a discussion on interpretations of the provisions of the Code of Fair Competition.

E. A. Bonneville of the Home Appliance Co., New York, was a luncheon speaker, his subject dealing with house-to-house selling. He discussed the subject both from the viewpoint of direct selling and selling by means of developing customers into salesmen.

Clarence E. Cooper of C. E. Cooper & Co., Inc., spoke on the importance of insurance and suggested methods for obtaining the proper protection.

At the afternoon business session E. J. Smith of the Underwriters Laboratories discussed Underwriter's Listings and Re-examination service. R. W. Oliver of the Standard Oil Co. of California spoke on the competition the industry faces.

Walter F. Vercamp of the Vercamp Corp., Cincinnatti, was elected chairman of the Emergency National Committee of the Liquefied Gas Industry along with W. G. Oliver, Standard Oil of California, San Francisco, and L. H. Spiner, Shell Petroleum Corp., St. Louis, as committeemen.

The Association voted to increase this committee to five by amending the Code on provisional members. R. W. Thomas of Philgas Co., Detroit, and J. J. Callahan of Hi-Heat Gas Co., New York City, were elected under this ruling to come into full membership upon approval of this change from Washington.

### Officers for Natural Gas Corp. of Oregon and Washington

Bernard Ford, vice-president of Blyth & Co., San Francisco, Calif., heads the recently purchased Natural Gas Corp. of Oregon and Natural Gas Corp. of Washington as president, and Mansel P. Griffiths, partner in Blyth & Co., Seattle, Wash., will act as vice-president for both companies.

Directors of the Oregon corporation are Dike White, Henry Boyd and Alfred E. Hampson, of Portland; directors of the Washington corporation are Eugene Bashore, Richard Ponting and Fred Loomis.

No holding company will be formed for the two companies, which were acquired in January from the Pacific Public Service Co., subsidiary of the Standard Oil Co. of California.

Mr. Ford is a vice-president of Pacific Lighting Corp., but it has been officially announced that Pacific Lighting is not a party to the butane property purchase.

### New Towns Added to Service of Wisconsin Rapids Gas Co.

Service of liquefied petroleum gas has begun in Hancock, Coloma, Nekoosa, Wautoma, Plainfield, and Adams, Wis., where branch offices of the Wisconsin Rapids (Wis.) Gas Co., are established, according to Lee H. Barker, general manager of the company. The Wisconsin Rapids Gas Co. receives its supply of liquefied natural gas at Wisconsin Rapids in tank cars which are unloaded into large storage facilities to which the town distribution lines are connected, and from which the company's truck receives its supply for delivery to smaller storage tanks located in outside towns.

### California Production on Increase

Daily average production of liquefied petroleum gases in California increased from 492 barrels to 593 barrels in December, 1933; and daily average sales increased from 478 barrels to 724 barrels, according to U. S. Bureau of Mines figures.

### Alabama Communities Want Butane

Ozark and Troy, Ala., have applied to the state public works advisory board for loans of $50,779 and $83,359, respectively, to construct butane-air city gas plants and distribution systems.

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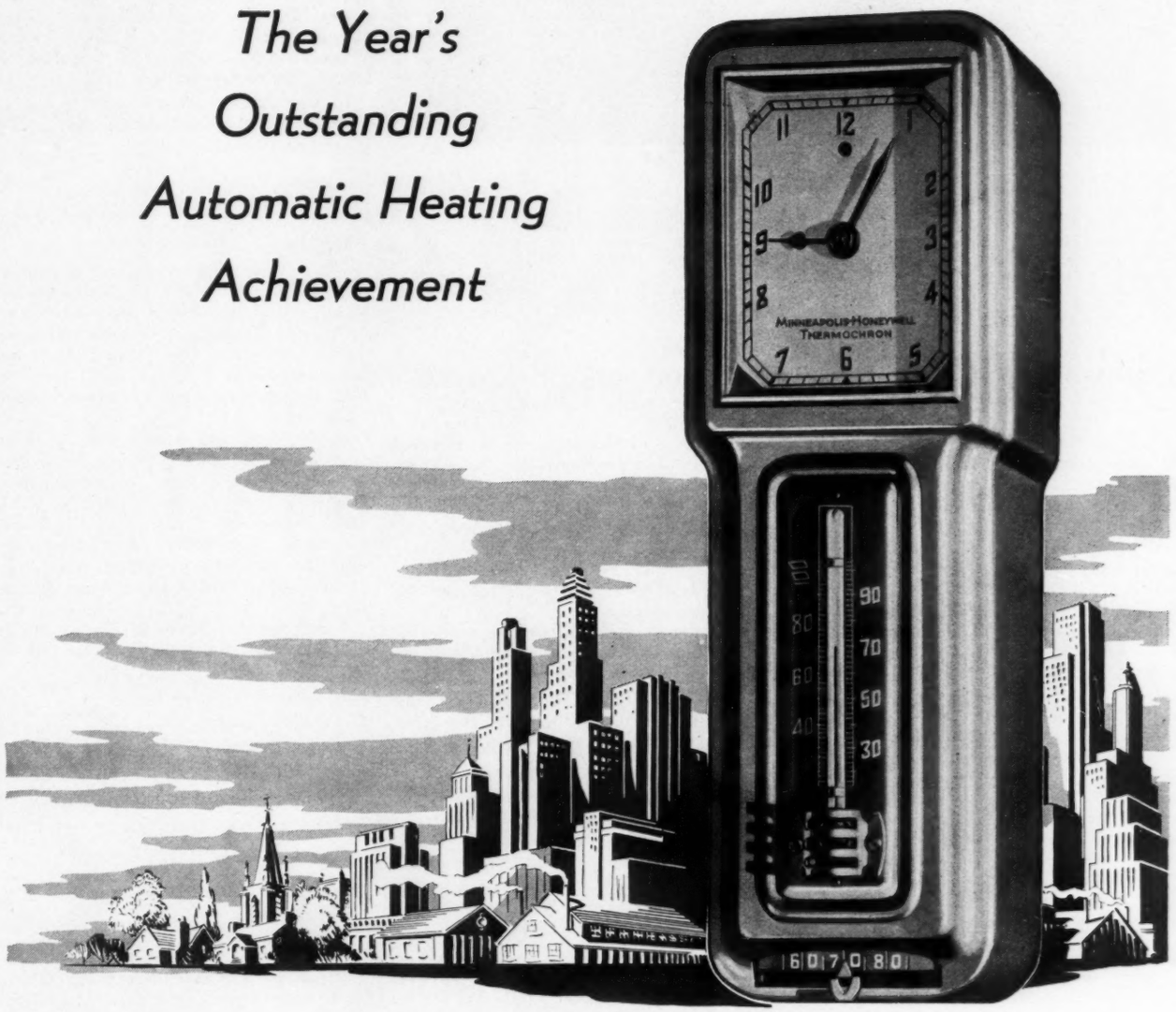


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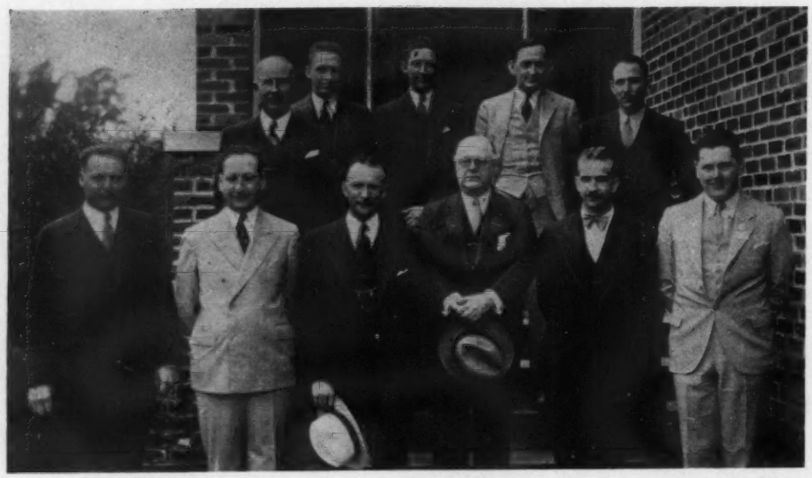


Members of 1934 Southwestern Gas Measurement Short Course Committee:

*Back row left to right*: J. H. Felgar, Dean, College of Engineering, University of Oklahoma; Gilbert Estill, Oklahoma Natural Gas Co., Tulsa, Okla.; R. D. Turner, Skelly Oil Co., Tulsa, Okla.; D. C. Williams, Kay County Gas Co., Ponca City, Okla.; E. E. Stovall, Lone Star Gas Co, Dallas, Texas.

*Front row left to right*: B. L. Maulsby, Oklahoma Natural Gas Co., Tulsa, Okla.; W. R. McLaughlin, Arkansas Natural Gas Corp., Shreveport, La.; W. H. Carson, Director, School of Natural Gas Engineering, University of Oklahoma; E. F. McKay, Oklahoma Utilities Association, Oklahoma City, Okla.; A. J. Kerr, Midwest Equitable Meter Co., Tulsa, Okla.; J. J. Hassler, Corporation Commission, State Capitol, Oklahoma City, Okla.

## Southwestern Gas Measurement Course April 24-26

AT a meeting, January 15, the general committee in charge of the Southwestern Gas Measurement Short Course, held annually at the University of Oklahoma, selected April 24, 25 and 26 as the dates for the 1934 course. This is a project of the College of Engineering of the University of Oklahoma, of which J. H. Felgar is dean, and the school is held each year in the engineering building on the university campus at Norman, Okla.

Gas measuring equipment is installed for exhibition and demonstration by the leading manufacturers of such equipment, and factory and sales representatives are on hand to demonstrate the same. These and university professors of mechanical engineering are the instructors for this school under direction of Professor W. H. Carson. Attendance at the school embraces employes of oil and gas and gasoline manufacturing companies who are concerned with the subject of measurement of either dry or casinghead gas. The declared purpose of the school is to increase the accuracy of measurement and the efficiency of regulation to the end that the public may be better served, the dealings between buyer and seller put on a more accurate and equitable basis, and that correct information regarding the engineering and practical problems involved be disseminated among the men in the industry.

The chairman of the general committee in charge of the 1934 course is W. R. McLaughlin of the Arkansas Natural Gas Corp., Shreveport, La. R. D. Turner of the Skelly Oil Co., Tulsa, Okla., will be in charge of exhibits this year, and D. C. Williams of the Kay County Gas Co., Ponca City, Okla., is chairman of the program committee. This project was established in 1924 and has had a registration in some years exceeding 400. On account of economic conditions the course was omitted in 1933.

## Manufactured Gas Industry Code Now Ready for N.R.A.

A CODE of Fair Competition under the National Industrial Recovery Act was approved on January 19 at a general meeting of the manufactured gas industry, held at the Waldorf Astoria Hotel under the call of H. O. Caster of New York, president of the American Gas Association.

Mr. Caster was elected chairman of the meeting and K. R. Boyes secretary.

The provisions of a code drafted by a committee were explained to the meeting by P. H. Gadsden of Philadelphia, vice president of The United Gas Improvement Co., chairman of the committee.

Committees were selected and authorized to present the code to the National Recovery Administration at an early date and to support it at the hearings which will ensue.

The following committee was appointed to present the code to the N.R.A.; P. H. Gadsden, vice president, The United Gas Improvement Co., Philadelphia, Pa., chairman; W. C. Beckjord, vice president and general manager, Boston Consolidated Gas Co., Boston, Mass.; Edward L. Davies, Long Island Lighting Co., Garden City, L. I., N. Y.; O. H. Fogg, vice president, Consolidated Gas Co. of New York, New York, N. Y.; N. Henry Gellert, president, National Public Utilities Corp., Philadelphia, Pa.; I. T. Haddock, vice president, New England Gas & Electric Association, Cambridge, Mass.; R. C. Hoffman, Jr., president, Roanoke Gas Light Co., Roanoke, Va.; S. E. Linton, president, Nashville Gas & Heating Co., Nashville, Tenn.; W. G. Rudd, vice president, The Peoples Gas Light and Coke Co., Chicago, Ill.; Herman Russell, president, Rochester Gas & Electric Corp., Rochester, N. Y.; Frank F. Schauer, vice president & general manager, Equitable Gas Co., Pittsburgh, Pa.; Fred W. Seymour, president, American Gas & Power Corp., New York, N. Y.; M. L. Sperry, president, Washington Gas Light Co., Washington, D. C.; G. W. Stiles, general manager, Portland Gas Light Co., Portland, Me.; James L. Stone, vice president and general manager, Spokane Gas and Fuel Co., Spokane, Wash.; and W. E. Woolfolk, president, Detroit City Gas Co., Detroit, Mich.

In accordance with the usual procedure, provisions of the code will be announced in Washington by the N.R.A.

### Householeating Efforts Produce New Load for Gas Service

FALL and winter householeating activities on The Gas Service Co. properties were highly productive of new load, according to F. M. Rosenkrans, new business manager of the Gas Service group. During the 11-week drive merchandise valued at $176,857 was sold, and the campaign quota was exceeded by $76,857.

In the campaign standing of the several Gas Service companies, Union Public Service Co., Merriam, Kan., of which Harold Diggle is new business manager, ranked first; Wyandotte County Gas Co., Kansas City, Kan., Jack Torbett, new business manager, second; and St. Joseph Gas Co., St. Josephs, Mo., Fred Karr, general manager, third.

Totals for the various equipment sold during the campaign are shown in the following summary:

| | |
|---|---|
| Gas designed furnaces or boilers | 216 |
| Conversion burners | 268 |
| Renovizing jobs | 693 |
| Water heaters | 243 |
| Large size space heaters | 685 |
| Radiant heaters | 1048 |

The Kansas City Gas Co. made a splendid record in the sale of gas-fired equipment, totaling 99 furnaces and boilers and 61 conversion burners.

This year for the first time The Gas Service Co. made a special effort to sell "renovizing jobs" to gas customers using conversion burner equipment. The renovizing installation consisted of a baffling system recently developed by the company and a new type high and low control thermostat.

The best record in selling this type equipment, was made by The St. Joseph Gas Co., totaling 248 installations.

### Zona Stevenson Appointed Cashier San Diego Cons. Gas and Electric

Appointment of Zona Stevenson as cashier of the San Diego Consolidated Gas and Electric Co. was announced in January. Mrs. Stevenson came to the company as a teller in 1921 and has advanced steadily through the collection department to her present position.

# RUUD 1934

## New Plans
## New Models
## New Improvements

RUUD has not been idle these past three years.

The preparation for the up-break in business has been thorough. New water heaters have been created, old ones have been improved and both have been subjected to severe field and laboratory tests that prove their worth unquestionably.

Results are ready for your inspection in the largest group of quality-built gas water heaters ever offered by this company.

*WRITE FOR SPECIFICATION SHEETS AND PRICES*

**RUUD MANUFACTURING COMPANY**
**Pittsburgh, Pa.**

*Factories in*
PITTSBURGH KALAMAZOO TORONTO
HAMBURG LONDON

# Rounding Out the Arizona Natural Gas Market

Tucson and Phoenix distributing companies.

Mining smelters and refineries, which make up the heaviest demand on the Western Gas line, have been operating on an erratic schedule, due to uncertain economic conditions in the copper industry. As a consequence gas demands have fluctuated abnormally, but a more stable load curve is anticipated with improvement in mining markets.

## *Change-Over*

*At Tucson:* The change-over at Tucson presented few special problems. About 5,000 of the company's 6,800 services were active, but all premises active and inactive were taken care of where the adjusters could gain admittance.

A thorough survey was conducted before adjustment began by a force of eight men from the company's permanent staff. Every effort was made through this survey to effect a good personal contact with the consumers, both commercial and domestic.

The Tucson company had at its disposal a force of 45 men, all of whom were experienced change-over adjusters. Indicating that these men were experts in their line, all had served as captains on earlier change-over crews. For this reason the company found it necessary to run only a two-day school, sessions of which were planned to stress company policy rather than mechanics of the change-over. A comprehensive booklet was prepared, condensing information on policy matters and mechanical details of adjustment operations, for the workers' guidance.

Service area was divided into five districts. The whole force of 45 men was put into each district covering each in four days. They reported to a single foreman. Adjusters carried identification cards on which their photographs appeared.

Advertising during the time of change-over advised customers of turn-on dates and described the zones affected.

For emergency service in the event of line failure, the Tucson company will mix butane with oil gas. Butane enrichment has been followed at the Tucson plant for the past three years, 460 B.t.u. oil gas being manufactured and brought up to the required 500 B.t.u. by addition of commercial butane.

The Tucson change-over began on December 13 and was completed on January 5. It was in charge of C. H. Webber, superintendent of the company's gas department.

*At Phoenix:* Introducing natural gas into Phoenix was greatly facilitated by the design of the gas distribution system. A high pressure system with a loop encircling the town carries 25 to 50 pounds pressure, and there are 25 district regulators feeding from the loop into the distribution mains.

Prior to entry of natural gas the high pressure loop was supplemented at several points, and a mile of welded steel 12-inch line laid from the city gates to the belt system.

*(Continued from Page 15)*

To blank off change-over districts the company installed 110 Dresser couplings which had been sawed in two, companion flanges being welded on with orifices of size identical to that of the pipe, and 16-gauge flange blanks inserted.

Distributing pressure at Phoenix is 30 inches, which was stepped up to 45 inches for the cutover to offset the pressure drop caused by dead-ending mains in blanking off the zones.

In preparation for natural gas all premises were surveyed far enough in advance to allow for ordering necessary materials. In the check-up of appliances particular attention was given to laboratory appliances and special burners. Some 1500 bunsen burners were replaced with new burners supplied free by the company.

A six-weeks school was carried on for 50 or 60 of the Phoenix company's own men, before the cutover began. Everyone on the job, including the special adjusters hired to supplement workers from the company's own staff, went through a three-day school just ahead of the house-to-house adjustment. Also, the first zone was cut down in size and a two-day period devoted to covering it. This was regarded as a schooling period during which the men worked in pairs, an experienced operator with each inexperienced one.

Change-over headquarters were established in the company's warehouse, the office organization consisting of an office manager, chief clerk, two assistants and four storekeepers. There were also a supervisor and assistant supervisor who spent most of their time in the field.

Ten teams of 16 men each plus a team captain were used in change-over operations. The 12,500 work orders were segregated into 19 zones, each zone being divided into several precincts, and each precinct being assigned to a team captain. One special crew operated on commercial and industrial work orders, but also assisted the residential crews whenever time permitted. To complete a zone required from a day to a day and a half.

During the night previous to change-over a special crew went through a zone to turn off all automatic appliances and pilot lights.

Most companies in changing over to natural gas have drilled burner ports on appliances only on special complaints. At Phoenix, however, the policy was adopted of drilling all burner ports to secure the same B.t.u. input as on the former gas, some 60,000 appliances being drilled. Two drillers were on each residential crew.

Adjusters took meter readings as part of their routine and entered them on the work orders, the top of which went to the billing department. New rates took effect on the day of the cutover in each zone.

Not-at-home call-backs were handled as a rule in the evening, doors being tagged on first call with notices stating that adjusters would be sent on request.

A mop-up crew was sent into each district in the afternoon of the day of the cutover to service complaints.

Every care was taken to maintain constant pressure on the zones in which cutover was under way. Lower pressure was held on the manufactured gas in these zones, so that natural gas would more easily displace the manufactured. From six to 15 bleeder points were provided in each district, enabling the crews to bleed down the different zones in two hours or less. Three crews of four men each handled the bleeding operations, and also the blanking off of zones.

The public informational campaign included mailing of card notice two days ahead of change-over in each zone. On the day before change-over doorknob notices were hung at each home. Advertising was carried in local papers one day previous to starting a new zone, each advertisement presenting a detailed zone map. Border-line customers who lived in one zone, but got their gas from another were notified by special call.

Some processing of natural gas will be done at Phoenix, though it will not be necessary to odorize. The gas as it comes from the well has a distinctive odor strong enough to make possible detection of leaks.

Both steam-fogging and oil-fogging will be carried on. Steam will be introduced at three points, into the high pressure belt system, at the plant low pressure outlet, and at the town of Tempe, a few miles outside of Phoenix. There are 25 points for oil fogging at district regulators. Cold atomization will be employed, using Western Gas Construction Co. foggers.

The Phoenix company will also treat its meter diaphragms with special oil when meters come through the shop for repair.

Oil gas of 525 B.t.u. has been served at Phoenix hitherto, and high B.t.u. oil gas will be manufactured in case of emergency.

Changes on the Phoenix distribution system, and the change-over program, were handled under the supervision of Roy T. Richards, operating superintendent. E. M. Jorgensen was supervisor of change-over operations.

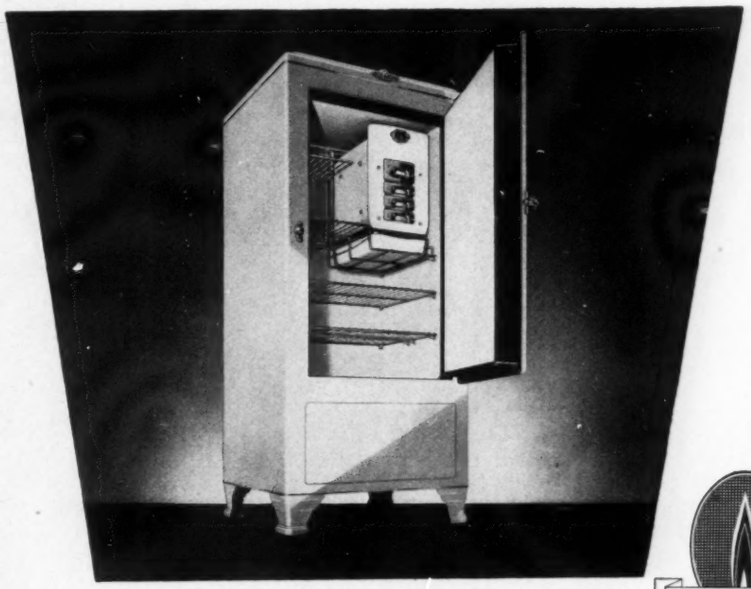
## *Load Building*

While the load-building programs of the Tucson and Phoenix distributing companies are still partly in the formative stage some comment upon them is of interest in connection with the recent arrival of natural gas.

Gate rates at Tucson and Phoenix are 40 cents per M c.f., with lower brackets for industrial sales and unaccounted-for gas. In both cities gas is sold on the therm basis.

Househeating load is naturally looked to by the Arizona companies for much of the potential sales increase, the heating season extending over nearly eight months and to-

# GAS COMPANIES ACCLAIM NEW BEAUTY... IMPORTANT NEW FEATURES... OF THE *1934 Air-Cooled* ELECTROLUX



USES NO WATER

***Greatest year in gas refrigeration history promised for organizations actively promoting this modern use of gas!***

1933 saw all records smashed with the introduction of the new air-cooled models!

Now with the new 1934 Air-Cooled Electrolux, an even greater success is foreseen!

The beautiful new models incorporate every worthwhile modern convenience . . . set a new high standard for refrigerator value. They're finished in gleaming white porcelain, in satin-smooth lacquer, or in a special new finish called Newtone, which will not chip or discolor. Hardware is smart, stainless chromium. And the new salesmaking features include a rubber grid in tray . . . handy vegetable freshener . . . interior lighting.

At the same time, Electrolux offers the famous operating advantages of silence, low cost to run, and freedom from costly repairs. Advantages that have been the deciding factors in the choice of Electrolux by hundreds of thousands of modern American families. Advantages that are unmatched in any other refrigerator.

The 1934 Air-Cooled Electrolux is a refrigerator any woman will proudly own. With a definite selling program — active merchandising — you can feel confident that an important share of the refrigerators installed in your territory this year will be *gas refrigerators!* So make your plans now!

Get the new models on the floor and in your windows at once! Your local efforts will be backed this year by the greatest advertising campaign gas refrigeration has ever had. Seven great national magazines will carry the Electrolux story to 12,000,000 homes each month! Messages going to *your* customers—interesting *your* prospects in Electrolux!

And bear in mind: every Electrolux you sell adds approximately 1500 cu. ft. to a customer's present requirements . . . takes the convenience user out of the non-profit class . . . gives a strong impetus to the sale of other gas-using appliances. For full details and sales and merchandising help, write, wire or phone Electrolux Refrigerator Sales, Inc., Evansville, Indiana.

NEW *Air-Cooled*
ELECTROLUX
THE SERVEL *Gas* REFRIGERATOR

talling something more than 2,000 degree days.

Sale of appliances and heating equipment is left in the hands of dealers at Tucson, but the Tucson Gas, Electric Light and Power Co. is going out after the househeating, commercial and industrial load aggressively through a force of four sales engineers.

Boiler load at the Pacific Fruit Express Co.'s plant for refrigerating equipment has already been signed, amounting to 100 million cubic feet a year. Laundries, bakeries, etc., are expected to net a considerable volume.

Househeating sales procedure has been carefully worked out. A special estimate form is filled out in duplicate on each job, one copy going to the dealer and one being retained at the gas company office. This form gives information on type of construction, estimated efficiencies, etc., for the jobs, as well as the estimate of consumption. Customers receive a different form consisting merely of monthly consumption and cost estimates.

Figs. 1 and 2 show the form in which special heating data have been worked up for Tucson conditions by the company's heating staff. Degree day records have been averaged over a five-year period with a separate record on the 1933-1934 season to date, and on the basis of this information a table of monthly fuel demand percentages has been developed. It will be noted (Fig. 2) that this table is broken into six divisions for the six billing dates used.

In estimating heating costs for individual jobs the Tucson househeating engineers go to the company ledger for the number of therms used under the old rate. The new rate is applied to this figure and the result constitutes estimated domestic requirements. The heating estimate arrived at from degree day data and information on the individual home is then added to get the total estimated bill, which is broken down into months by use of the table on monthly fuel demand percentages.

Central Arizona Light and Power Co. has built its plans for load-building in the Phoenix area around a direct sales program with provision for close cooperation with dealers. Nine territory salesmen and one floor salesman at present are employed, the territory salesmen working both on domestic and househeating sales. These salesmen work in closed territories averaging about 1,000 meters apiece. They are all given a salary guarantee plus a commission. A special commission arrangement is also in effect for assistance rendered by company salesmen on dealer sales.

Industrial and large commercial or heating sales are handled through the company's sales engineering department in which four sales engineers are employed. These men render special assistance on domestic sales where required. They work on straight salary.

On househeating equipment the company works with distributors and dealers and will finance all househeating jobs which conform to proper standards. Engineering assistance is also extended the dealers on househeating sales. Sales cooperation and financing assistance are only extended on A. G. A. approved equipment.

A residential survey was conducted in advance of change-over in Phoenix, listing existing heating equipment, type of home construction, and other pertinent information. From this a prospect list was built. A complete survey is now being made on commercial and industrial prospects by the sales engineering department, the better prospects being closed where possible during the survey.

On February 5 the company opens a househeating school to which dealer salesmen as well as company sales staff are invited. Weekly sales meetings are already being held, attended by dealer salesmen. Through the househeating school the company's domestic salesmen will be given specialized training in househeating work in preparation for an intensive summer sales campaign on heating.

A special househeating manual is being prepared by the company to be used in conjunction with the American Gas Association's househeating manual, and dealing with requirements of the Phoenix situation. Heating demands are subject to sharp peaks in Phoenix, both over the daily range and over the heating season. One-third the heating bill may fall within a single month. For estimating heating costs company heating engineers are using the "degree hour" as their basic unit rather than the degree day.

Rates in Phoenix have been on the therm basis for more than a year. With the new gas a $1 minimum charge is called for, as was the case with manufactured gas. Former rates for the first five therms were $1.80 and are now $1.60—an 11.1 per cent saving on the therm basis. The saving ranges as high as 57.4 per cent for consumption of 150 therms. The general gas service rate is 32 cents per therm for the first 15 therms per month, 15 cents per therm for the next 10 therms, 7.5 cents per therm for all additional —plus the $1 minimum charge.

Commercial gas service, calling for a minimum guarantee of $300 per year, is rendered at 7.5 cents per therm for the first 500 therms per month and 5 cents per therm for all additional.

The commercial and semi-industrial rate ($1200 per year minimum guarantee) is 5 cents per therm for the first 200 therms per month and 3 cents per therm for all additional.

Savings under the commercial rate range from 64.2 per cent for 300 therms to 70 per cent for 1400 therms.

With transmission line construction complete, distributing systems made ready, and customers' change-over accomplished, the Arizona natural gas scene is now set for a sustained load-building effort. The end of 1934 should see residential sales per customer boosted by a good househeating demand, while load factor on the pipeline system should be improved by addition of new industrials and resumption of normal operation in plants already connected.


# Engineers and Constructors

**Vertical Flue Combination Coke Ovens**
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**By-Product Recovery Apparatus**
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## Semet-Solvay Engineering Corporation

**40 Rector St.** **New York, N. Y.**

***Send us your name for our mailing list to receive literature as issued, describing our equipment, engineering and processes.***


## New Line Serves Ada, Okla.

Consumers on the Southwest Gas and Utilities Co., Ada, Okla., system have been receiving gas through the new 14½-mile pipe line from the John Fitts field in Southern Pontotoc county since October 31. Stonewall Gas Co., recently organized, layed the line, four miles of which is 6-inch and the remaining 5⅝-inch all of welded construction.

# LOW-COST MAINTENANCE IS WHAT COUNTS

A reckoning that looks at the cost of installation alone and not at the cost of maintenance is not a true gage of pipe-line investment. How much will it cost to keep the system going year after year?—that is the important question. The answer depends largely on the pipe that is used.

After considering everything involved, again and again those responsible for large pipe-line projects have found in NATIONAL Pipe their best assurance of low-cost maintenance and of profitable investment. They have always found NATIONAL—

1. **Strong enough to sustain the highest pressures.**
2. **Ductile enough to bear the most abnormal strains during installation and afterward.**
3. **Durable enough to give long service under all conditions to which pipe is exposed.**

The experience and knowledge of the world's largest manufacturer of tubular products are incorporated in the scientific production of NATIONAL Pipe. It is made under the strictest mill supervision, in full conformity to the latest standard specifications. That is why engineers and field men on major gas lines usually prefer NATIONAL Pipe. General approval has made it—

***America's Preferred Line Pipe***

NATIONAL TUBE COMPANY • Pittsburgh, Pa.
Subsidiary of United States Steel Corporation

# NATIONAL PIPE

# Program for Eastern Natural Gas Sales Conference

A FINAL program has been released for the 1934 Eastern Natural Gas Regional Sales Conference, which will be conducted by the A.G.A. Commercial Section, on February 8 and 9, sessions being at the William Penn Hotel, Pittsburgh, Pa. Following is the announced program.

**February 8—10:00 A. M.**

Opening Remarks by the Chairman—E. E. McCormick, The Peoples Natural Gas Co., Pittsburgh, Pa.

Keynote Address—N. T. Sellman, Chairman Commercial Section, A.G.A., New York, N. Y.

Market Possibilities of Space Heating:
With Radiant Heaters—W. G. Carlin, Natural Gas Co. of W. Va., Wheeling, W. Va.

With Circulating Heaters—O. J. Haagen, The Gas and Electric Appliance Co., Columbus, Ohio.

With Unit Heaters—L. F. Ryall, General Gas Light Co., Kalamazoo, Mich.

Round Table on 1934 Space Heating Plan

**February 8—2:00 P. M.**

Presiding: S. B. Severson, Republic Light, Heat & Power Co., Inc., Buffalo, N. Y.

Refrigeration from the Natural Gas Viewpoint—B. H. Gardner, Columbia Engineering & Management Corp., Columbus, Ohio.

Rental—Lease—Sales—Plans—W. A. Tobias, Hagerstown Light and Heat Co., Hagerstown, Md.

Large Volume Water Heating—H. B. Yost, Hope Natural Gas Co., Clarksburg, W. Va.

**February 9—10:00 A. M.**

Presiding: F. B. Jones, Equitable Gas Co., Pittsburgh, Pa.

Customer Reaction from the Home Service Viewpoint—Elizabeth Sweeney, Empire Gas & Electric Co., Geneva, N. Y.

Holding and Developing the Industrial Gas Load—Karl Emmerling, East Ohio Gas Co., Cleveland, Ohio.

Necessity of Sales Development from the Executive's Viewpoint—J. French Robinson, Peoples Natural Gas Co., Pittsburgh, Pa.

**February 9—2:00 P. M.**

Presiding: B. H. Gardner, Columbia Engineering & Management Corp., Columbus, Ohio.

Effective Advertising Under Today's Conditions—Emil Hofsoos, vice-president, Ketchum, MacLeod and Grove, Pittsburgh, Pa.

Hotel and Restaurant Sales Development Activities—R. H. Staniford, The Brooklyn Union Gas Co., Brooklyn, N. Y.

Winter Air Conditioning—S. H. Baldwin, Bryant Heater Co., Cleveland, Ohio.

## R. W. Hendee Now President of Oklahoma Natural Gas Co.

*R. W. Hendee*

R. W. Hendee was elected president of the Oklahoma Natural Gas Co. at a meeting of the directorate on January 26. He succeeds A. E. Bradshaw who resigned earlier in the month to become president of the National Bank of Tulsa. In the interim Mr. Hendee has acted as executive vice-president. He was president of the Oklahoma Natural Gas Corp. prior to its reorganization as the Oklahoma Natural Gas Co.

Under the new executive set-up Mr. Bradshaw becomes chairman of the Oklahoma Natural board of directors.

Mr. Hendee is well known in natural gas circles having held executive positions in the southwest for a number of years.

## Public Service Corp. of Tenn. May Begin Activities in Feb.

Public Service Corp. of Tennessee, controlling a number of gas franchises in towns of eastern Tennessee, expects to launch a line construction program in that area some time in February, according to word from J. H. Graham, president.

The company headquarters in Sunbright, Tenn., and is holding organization for Rock Creek Oil Co. which will handle production; Sunbright Pipe Line Co., the transportation company; and the Harriman Gas Co., which is being set up to engage in gas distribution.

Officers of the company in addition to Mr. Graham are Dr. S. H. Jones, vice-president, and Mrs. Wilhelmina Andrews, secretary. T. M. Kingsbury is consulting engineer and H. W. Young, field superintendent.

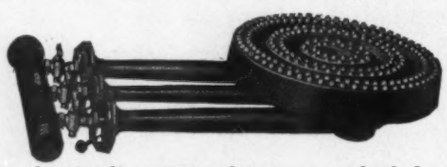
Through the Sunbright Pipe Line Co. the organization expects to begin construction of about 160 miles of line from the Sunbright field.

## Financing Sought for Montana to Minneapolis-St. Paul Line

Application for a loan to finance the construction of a natural gas line from Montana fields to supply service to Minneapolis and St. Paul, Minn., have been made to the Federal government, according to C. I. Tenney, president of the Willmar (Minn.) Gas Co., controlled by Continental Public Utilities Corp., Minneapolis, of which Mr. Tenney is a director. The cost of the project is estimated at $17,000,000 and the proposed line would go through Willmar enroute to Minneapolis-St. Paul.

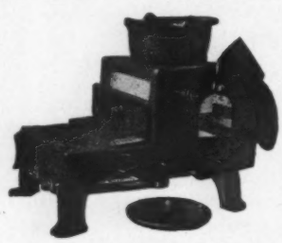
## Byllesby Sales Conference

A conference in which all sales managers of Byllesby Engineering and Management Corp. properties will be in attendance is scheduled for February 6-9 in Chicago, Ill. Definite sales and load-building plans of the utilities for 1934 will be made at the meeting.

**HIGHLY EFFICIENT GAS BURNER**

**The Johnson 60BCE Ring Burners are highly efficient units designed for a multitude of uses. Complete unit as shown, is 15 inches in diameter and is composed of three separate ring burners which may be used separately or in any combination.**



**COMBINATION BENCH FURNACE FOR EVERY SHOP USE**

**The Johnson No. 118 Bench Furnace will meet all the requirements of any shop. Melts soft metal, heats the largest soldering coppers, designed for heat-treating and will heat long rods through special side doors in the hood. The No. 118 is a practical addition to any shop. Write for details.**

**ADJUSTABLE TORCH AND MELTING POT**

**The Johnson No. 8 is an ideal torch for plumbers, metal workers and for general shop use. Designed for soldering and metal melting. The burner is adjustable to any angle or may be removed and used as a hand torch.**

**JOHNSON GAS APPLIANCE CO.**
**Cedar Rapids IOWA**

**Pacific Coast Representative—C. B. BABCOCK CO.**
**135 Bluxome St., San Francisco, Calif.**

## Report Issued on Cause of German Gas Holder Explosion

The Institution of Gas Engineers (England) has issued a report on the serious explosion of a gas holder of the waterless type which occurred at Neunkirchen, Germany, last year. The report shows that the primary cause of the disaster was the use of a torch by a workman when working on a by-pass main in the vicinity of the holder. Gas had apparently leaked into this and caused a minor explosion which damaged a valve at the end of the by-pass allowing flames to spread up the outside of the holder. The explosion of the holder which followed is ascribed to the expansion by outside heat of its side sheeting, and not to any defect in the gas-tight fitting of the piston within it.

## Net and Gross Revenues Up For Pacific Lighting Corp.

Pacific Lighting Corp. reports a net income for 1933 of $7,953,551.69. In 1932 the balance available for dividends was $7,635,373.40. Gross revenue increased $624,697 over 1932, amounting to a total of $45,382,363.52. Revenue increases were due largely to pick-up in industrial gas sales during the latter two-thirds of the year on the systems of Los Angeles Gas and Electric Corp., Southern California Gas Co., and Southern Counties Gas Co., subsidiaries of Pacific Lighting.

## Simplified Practice and Commercial Standards Work to Continue

The Department of Commerce, Washington, D. C., in January announced that simplified practice and commercial standards work at the Bureau of Standards would be continued, in cooperation with the American Standards Association and other organizations concerned with such work. The work has an added importance at this time because of the need for reference to standards of dimensions and quality in the N.R.A. codes for fair competition, according to Lyman J. Briggs, director of the Bureau.

## 1/4-Cent Natural Gas Tax Passes Montana Legislature

House Bill 28 introduced in the current session of the Montana legislature called for a tax of 1 cent per Mc.f. on natural gas produced in that state. On January 10 the Montana Senate passed the bill, amending the 1-cent tax to ¼ cent.

## 11.9 Per Cent Gas Meter Increase For Montana Power Co.

Active gas meters on the Montana Power Co., Butte, Mont., increased 11.9 per cent, or 1123 meters, as of December 1, 1933, over December 1, 1932, according to F. M. Kerr, vice-president and general manager of the company.

## Stand-by Plant at Council Bluffs, Ia.

A stand-by plant to supplement natural gas service has been installed by the Council Bluffs Gas Co., of which H. C. Holder is manager.

GREETINGS, gentlemen of the western gas industry! The Estate Gas Range speaks for itself—through the 5-tube radio built into the mantel back. And what a world of things it has to talk about. Fresh-Air Oven—built like a double boiler. Time Control (and now's the time to plug that feature hard). Single-Dial Oven Control—set the ThermEstate, and you turn on the gas and light it—all in one operation! Cooking-top lamp. Owner's monogram in chromium letters. Everything that it takes to sell more ranges and better ranges is found in the Estate Line. The Estate Stove Company, Hamilton, Ohio. Warehouse stocks in Los Angeles, San Francisco, Portland, Minneapolis, Dallas.

# Mid-West Commercial Men to Hear Worthwhile Program

ON February 15 and 16 gas company commercial executives of the middle west will gather at Hotel Sherman, Chicago, for the annual Mid-West Regional Gas Sales Conference. This is being staged for the 8th successive year by the American Gas Association's Commercial Section, J. W. West, Jr., secretary. An excellent program has been formulated, details of which are given below:

**February 15—10:00 A. M.**

Opening Remarks by the Chairman—E. J. Boyer, Minneapolis Gas Light Co., Minneapolis, Minn.

Keynote Address—"Fundamentals of Recovery"—Royal F. Munger, Chicago Daily News, Chicago, Ill.

Rental—Sales Plans (With especial reference to New England Experience on Water Heating)—J. J. McKearin, Lowell Gas Light Co., Lowell, Mass.

**February 15—2:00 P. M.**

Presiding: Henry K. Dropp, Milwaukee Gas Light Co., Milwaukee, Wis.

Electric Cooking Competition:

1. From the Gas Company Viewpoint—Don Wilkins, Duluth Water and Light Department, Duluth, Minn.
2. From the Manufacturer's Viewpoint—I. W. Peffly, American Stove Co., Cleveland, Ohio.

Cooperative Gas Range Campaigns—W. E. Derwent, Geo. D. Roper Corp., Rockford, Ill.

Kitchen Modernization for Greater Sales—F. M. Rosenkrans, The Gas Service Co., Kansas City, Mo.

**February 16—9:30 A. M.**

Presiding: A. E. Schwarz, Minnesota-Northern Power Co., Minneapolis, Minn.

Customer Load Expectancies—Stanley Jenks, Northern Indiana Public Service Co., Hammond, Ind.

Water Heating Sales Through Upstairs Controls—J. B. Druse, Milwaukee Gas Light Co., Milwaukee, Wis.; T. E. Grant, American Gas Products Corp., Chicago, Ill.

Gas Refrigeration Today—E. E. Linburg, Electric and Gas Utilities Co., Terre Haute, Ind.

**February 16—2:15 P. M.**

Presiding: W. L. Jones, St. Louis County Gas Co., Webster Groves, Mo.

Forced Air Heating with Gas—E. A. Jones, L. J. Mueller Furnace Co., Milwaukee, Wis.

Discussion by: Geo. Uhlmeyer, Peoples Power Co., Moline, Ill.

Space Heating—A Neglected Load Builder—Joseph McKinley, Equitable Gas Co., Pittsburgh, Pa.

Selling Heating in the Chicago Area—W. R. Evans, The Peoples Gas Light & Coke Co., Chicago, Ill.

PAYNE
ANNOUNCES
NEW
1934
PRICES

The new schedule complying with the recently approved code for gas appliance manufacturers is now ready for distribution.

Write for your copy at once.

**Payne Furnace & Supply Co.**
*Since 1914*
**Beverly Hills, Calif.**

Made in ¼", ⅜", ½", ¾", 1", 1¼", 1½", and 2" sizes

We're Against It!

So are you, so are your customers against high gas costs. And your customers don't have to pay them if you install a BARBER Gas Pressure Regulator for them.

Write now for literature and details of this device that makes satisfied customers and good profits for heating men everywhere.

The Barber Gas Burner Co.
3702-4 Superior Avenue
CLEVELAND . . . . . OHIO

## L. A. G. and E. Appoints Adv. Mgr. and Home Economists

LOS ANGELES (Calif.) Gas and Electric Corp. as a part of its 1934 gas load-building program announces several new appointments. J. S. Spaulding has been made advertising manager of the company. Mr. Spaulding was formerly in charge of copy preparation for the joint advertising program of the Los Angeles Gas and Electric Corp., Southern California Gas Co., and Southern Counties Gas Co., as advertising manager. He was more recently with the McCann-Erickson Advertising Agency in the Los Angeles office.

*J. S. Spaulding*

Victoria Warren, formerly home economist for the Tappan Stove Co., Mansfield, Ohio, is now home economist for L. A. G. and E., conducting programs for cooking schools for the company in cooperation with local newspapers. Pauline Ferrill is assistant to Miss Warren.

Miss D. H. Allen of the advertising department is now writing home economics articles for general newspapers in connection with the L. A. G. and E.'s broadened load-building program, covered elsewhere in this issue.

## Natural Gas for Muskegon Through 55-Mile Line

American Michigan Pipe Line Co., newly organized with headquarters at Muskegon, Mich., as a subsidiary of American Light and Traction Co., has contracted with United Light and Power Corp., Davenport, Iowa, to lay a 55-mile line from the Mecosta County field in central Michigan, to Muskegon, according to late January reports. It is understood that United Light and Power has already begun preliminary survey for the line, work on which may start about March 1. Construction will require about four months.

American Michigan Pipe Line Co. recently concluded a contract with Taggert Bros., Inc., who developed the Mecosta County gas area, for gas production sufficient to supply Muskegon. Distribution at Muskegon is by Muskegon Gas Co., American Light and Traction unit.

## Missouri Ass'n of Public Utilities to Meet April 19 and 20

The 1934 annual convention of the Missouri Association of Public Utilities will be held in Excelsior Springs, Mo., on April 19 and 20, at The Elms Hotel, according to Jesse Blythe, assistant secretary of the Association.

## Cooper-Bessemer Corp. Offers 1934 Calendar

The Cooper-Bessemer Corp. of Mt. Vernon, Ohio, again this year has published an attractive calendar. Members of the gas industry who desire the 1934 calendar may receive it by applying to the company.

# THERE'S MORE BUSINESS IN SIGHT . . . . .

# . . . . . IF YOU KNOW WHERE TO LOOK!

ASK your neighbors how long it has been since anyone called at their homes to explain the advantages of owning a new, modern Gas Range.

But it really isn't necessary; you can answer the question yourself.

Why not start now to make house-to-house solicitation a regular part of your merchandising plan?

Just look at the market . . . wide open to such a program. More than 400,000 Gas ranges are connected to P. G. and E. mains. All of these, ten years old or more, are certainly obsolete, unattractive and inefficient. Obviously, then, 40,000 ranges are in dire need of replacement every single year . . . to say nothing of old wood and coal stoves, new buildings and brides.

Yet less than 22,000 Gas ranges were sold in the entire territory during 1933—replacements and new installations combined.

Regardless of the generally sub-normal sales volume last year, many wide-awake dealers enjoyed a remarkable Gas Range business. The methods these dealers employed might well be followed by every dealer who wants a bigger share of business during 1934.

First, they engaged in more direct selling. Second, they advertised more methodically. Third, they participated enthusiastically in the activities of the Gas Appliance Society.

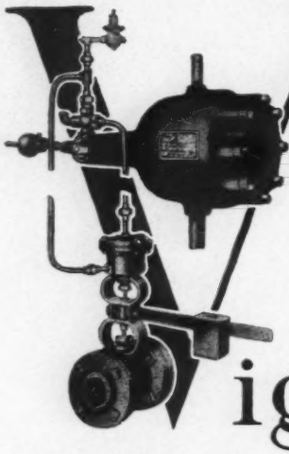
The brightest spot in Gas Range sales last year was the sales promotional campaign conducted by the Gas Appliance Society. More than 2000 ranges were sold in a single week.

This spring the Society will sponsor an even more ambitious program. Again, this campaign will demonstrate what well planned, cooperative measures can do. Dealers, distributers and manufacturers will find it highly profitable to give this campaign their whole-hearted support.

**P · G · and E ·**

PACIFIC GAS AND ELECTRIC COMPANY

OWNED . OPERATED . MANAGED BY CALIFORNIANS



V-port VALVE

C-F

Vigilant

FOR quiet operation at all times when demands are fluctuating, for sure and exact regulation under light loads as well as heavy, a Vigilant Liquid Level Regulator with V-port Valve is recommended. Wide-open, it has a capacity equal to that of the pipe. When flow is at minimum, V-port valve assures free throttling action.

There is a C-F regulator exactly suited to every requirement of gas control. Well known for more than 40 years. Catalog on request.

The Chaplin-Fulton Manufacturing Company
28-40 Penn Avenue Pittsburgh, Pa.

*REPRESENTATIVES*

WESTCOTT & GREIS, Inc., Sales and Service—Dallas—Tulsa
JNO. W. CRAWFORD, Sales Engineer, 1855 Industrial Street, Los Angeles
PARSONS ENGINEERING COMPANY, Los Angeles, Calif.—San Francisco, Calif.
Or Any Jobber

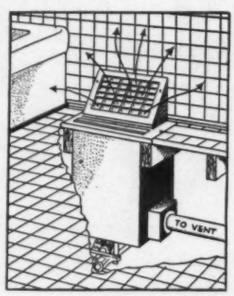
WARD WALL-HE-TOR

Economical gas heat for the bathroom

Now for the first time in gas history, a vented appliance, ornamental, and taking up little space, is available for bathrooms. This has been made possible by the Ward Wall-He-Tor, which will heat the average bathroom for as little as half-a-cent an hour, depending upon local gas rates.

Wall-He-Tors are ideal for dens, breakfast rooms, and small bedrooms. They may also be used as unit systems for houses without basements.

Write for literature, terms, and prices. Ask about Ward Floor Furnaces with Bilt-In Thermo-Control.




WARD HEATER COMPANY
1800 W. Washington Blvd.
Phone PArkway 9171 Los Angeles, Cal.

Learn why PAPICO ODORIZERS *save labor, odorant—and give better results.* WRITE FOR BULLETIN 05

HARRY F. HALDEMAN, INC.
ENGINEERED PRODUCTS
411 West Fifth St. Los Angeles, Calif.


## How Valuable Is the Gas Engine Load?

*(Continued from Page 11)*

turists to meet the payment of bills. It was found that the "net uncollectible" on gas bills, as an average over six years including the "depression" period, was 12.3 per cent less for gas engine business than for domestic business.

This can be attributed to the fact that water is the primal requirement for agriculture in that territory, and industrials—the other principal field of application of gas engines—have been relatively reliable.

*IV. General Extensions of Gas Service Into Rural Districts Made Possible*

Nearly every gas main that may be extended in order to serve gas engine business enables the company to secure many added domestic customers. Furthermore, certain extensions of facilities into small communities, unincorporated towns, etc., may be made possible because of revenue obtained from gas engine business secured along the route. This class of business therefore has been a definite factor in extending facilities to serve new territory.

*V. An Effective Weapon to Combat Diesel Power: An Advantage to All Utilities*

The gas engine has been demonstrated to be a very effective means to combat the installation of diesel engines. All factors considered, the gas engine is a superior and more advantageous power unit for isolated plants than the diesel engine.

Furthermore, the manufacturers of most diesel engines represented in this territory are also builders of gas engines; and because these manufacturers can see the mutual advantage of availing themselves of gas company sales cooperation, the majority of these engine representatives push their gas engine actively where natural gas service is available.

These factors have been responsible for preventing the loss of considerable power business from utility lines to an outside competitor.

There are certain problems incident to the acquisition of this attractive gas engine load. A rather specialized sales personnel is required to sell this business, largely because of the large capital expenditures involved on the part of the customer, and the engineering details involved. A coordinated engine service plan is necessary, in order that the engines may be kept running at peak efficiency. It is advisable to adopt some plan of cooperation with the various merchandisers of gas engines in the field. And combination gas and electric utilities have a peculiar problem to solve, the answer depending upon their individual evaluation of all the existing conditions.

These problems, however, can be worked out very satisfactorily, and the nature of this very lucrative class of business warrants the consideration of every gas company. Gas engine business bids fair to become a major activity in the sales programs of many gas utilities in the near future. The field is big, but it requires and justifies consistent cultivation.

## 1934 Sales Set-Ups

*(Continued from Page 18)*

products will be permitted at these schools. The company's home economist will "run the show" and will produce a program with maximum appeal, limiting manufacturers' products to incidental mention.

To carry through the cooking school programs the company has added a competent home economist and an assistant to its staff.

In all, the company has laid out a systematic program provided with adequate forms and proper supervision at all points. Results are already beginning to reflect the effectiveness of the new procedure. In the Alhambra office, from which about 19,000 meters are served, sales from the company floor during the month of December, the first in which the plan had operated, were boosted to $8,000 whereas November sales came to only $3,000.

From the foregoing review of 1934 sales organization in Southern California it appears that this section should add gas load in record amounts during the present year. Other sections are contributing equally aggressive programs, which will be reported through *Western Gas* in succeeding months.

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### Summers Resumes Management for So. Counties at Ventura

Carl Summers, formerly Ventura district manager for Southern Counties Gas Co. and for a number of years manager of the company's pipe line district with headquarters in Ventura, Calif., on February 1 again became district manager for Ventura County. Mr. Summers will also continue in charge of the gas company's production department and pipe line district.

B. F. McBurney, who has been acting district manager since the transfer of former manager Fred Merker to the Orange County district, will resume his former position as district superintendent with a number of added responsibilities made necessary by the combining of the production department with the Ventura district under the direction of Mr. Summers.

Mr. Summers has been with Southern Counties since 1915. He came to Ventura in 1919 to assist in the organization of the gas properties in the county which had just been acquired by the company.

### Ferndale and Bellingham, Wash., May Get Natural Gas Service

The recently organized Whatcom Natural Gas Co., Bellingham, Wash., has applied for franchises to serve natural gas in Ferndale and Bellingham, Wash., and plans construction of approximately 10½ miles of 4-, 8- and 10-inch pipe line, according to C. S. Shippey, president. Gas supply is to come from three wells of the company in Whatcom county, having an output of 1,000,000 cubic feet a day.

Other officers of the company are H. O. Griffin, vice-president; A. L. Morrison, secretary-treasurer. The trustees are Henry Luce, S. A. Meyers and Ivan Merrick. Application for permission to sell $250,000 worth of stock in Washington, at $5 per share has been made.


WE SAY:

. . . . "These are *the* Perfect Appliances for Maintaining Uniform LOW GAS PRESSURES"

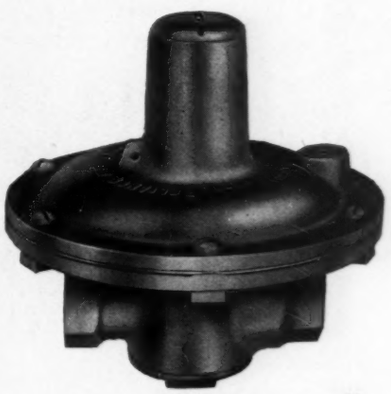
•

*and 100,000 Installations*

Prove we're RIGHT!

TYPE A
Weight loaded—
⅜" to 3"
Also Spring Loaded
in Same Sizes.

Reliance Type A—weight loaded and Type Y — spring loaded (or House) Regulators provide POSITIVE control of low pressures. 100,000 installations offer proof of their wide use in regulating pressure to all kinds of household gas appliances. Reliance Regulators capably handle large volumes with low differential pressures, especially, where on low pressure systems, pressure is boosted on peak loads. When consumption ceases, Reliance Regulators "lock-up" pressures, without creeping. Write for full details and prices.



TYPE Y
Spring Loaded
¼" to 1¼"

+RELIANCE REGULATORS+

RELIANCE REGULATOR CORPORATION

1000 Meridian Avenue • Alhambra, California

MANUFACTURERS OF GAS REGULATORS FOR ALL PURPOSES

GENERAL CERAMICS COMPANY

• REFRACTORIES •

**Refractories for Conversion Burners, Space Heaters, and Circulating Heaters. Quality maintained by modern production methods, careful workmanship, and accurately controlled burning. Our engineers will gladly cooperate on new designs, alterations, production economies, etc.**

**General Ceramics Company, 71 West 35th Street, New York**

# NOW READY

## The "BLUE BOOK"

## PERSONNEL DIRECTORY *and* BUYERS' GUIDE *of the* GAS INDUSTRY

**1934 Edition**

This directory gives the personnel of gas utility district offices as well as headquarter companies, arranged by states and including distributing companies, pipe line companies, producing companies and holding companies. Each distributing company lists the kind of gas served—pressure—B.t.u. content—number of meters and indicates whether or not each company merchandises.

Correct as of January 1st, 1934, it is the most complete and up-to-date directory available—**includes the entire United States.**

***Published in convenient Pocket Size!*** **5x7 in.**

**1-10 copies, $2.50 each**
**10-20 copies, $2.00 each**
**20 or more $1.50 each**

***MAIL COUPON TODAY!***

**WESTERN GAS, "Publishers",**
**810 South Spring St.,**
**Los Angeles, California.**

**Date**.....

**Please send me**.....**copies of the "Blue Book" Personnel Directory 1934 edition of the Gas Industry at $**.....**per copy, for which I enclose remittance of $**......

**Name**.....

**Address**.....

.....

**By**.....


## Good Ad Copy on Theme of Pipe Line Break

AT five-thirty Thursday morning, January 4 a weakened section of Memphis Natural Gas Co.'s 447-mile gas pipe line near Tunica, Miss., blew out. The break was quickly repaired and normal pressure restored within 12 hours, but meanwhile Memphis newspapers had made much of the occurrence with headline treatment—even though the company's stand-by plant had maintained partial service for most Tennessee consumers during the day.

This situation introduced a delicate problem for the solution of those directing Memphis Natural Gas Co. advertising. In just what tone should the company's patrons be addressed the morning after the pipe line break? A series of institutional advertisements were being carried by the company at the time.

Instead of taking an apologetic attitude and thus magnifying the proportions of an unavoidable accident, the company's ad men seized on the incident as a way of proving to present gas consumers and prospects alike the real value of natural gas—through the absence of its service for a few hours.

Caption on the ad, run in 1050-line space, referred to the "disaster" as "a short pause in 43,900 hours of carefree, unceasing, untroubled service," followed by the old proverb, "Nothing is ever truly appreciated until we have to do without it."

Copy went on to plug the enormous value to Memphis and the 40 other Tennessee, Mississippi, Arkansas and Louisiana towns served by the company of the continued, unfailing service since the pipe line's completion on Jan. 1, 1929.

"We do not go back to horses and buggies, when the starter on our car fails to work on an icy morning," the ad continued. "We do not yearn for oxcarts if perchance railroads are cut off for a few hours. For every airplane that has fallen, a thousand more have been built to fly the airlanes. That is progress."

Favorable reaction to the ad included a first-column editorial quoting and reiterating its message in the Memphis Press-Scimitar two days later.

The Memphis Natural Gas Co. launched its first advertising to consumers in December through Lake-Spiro-Cohn, Inc. All natural gas copy run in Memphis and its territory previously has been carried by local utilities which distribute the gas at retail to the public. The current campaign is being directed by Bernard L. Cohn and written by John C. Ottinger, Jr., of the Lake-Spiro-Cohn organization.

### 150-Mile Natural Gas Pipe Line Contemplated for Texas

The firm of John W. Moore & Sons, Lubbock, Texas, is reported to have applied for a loan of $1,000,000 through the Public Works Administration to construct a 150-mile, 8-inch natural gas pipe line from the Brown County fields in Texas to Goldthwaite, San Saba, Lometa, Lampasas, Burnet, Llano, Fredericksburg and Kerrville, Texas.

## Industry Loses Able Leader in Clare N. Stannard

THE death of Clare N. Stannard, vice-president and general manager of the Public Service Co. of Colorado, Denver, was briefly announced in last month's issue of *Western Gas*. Mr. Stannard's passing on January 3 took from the industry one of its most able leaders, and the following facts on his career will be of general interest.

Born in Friendship, N. Y., in 1869, Mr. Stannard received his high school education at Binghamton, N. Y., and upon graduation secured employment with the Binghamton Gas & Electric Co. He enlisted as a cadet and advanced through the banking, street railway, gas, electric, and water divisions of the company. In 1897 he moved to Denver, accepting a position in the master mechanics and auditing department of the Denver Tramway Co. A year later he joined the staff of the Denver Consolidated Gas & Electric Co., continuing in its employ when the company merged with the Denver Gas Co., and when it later became the Public Service Co. of Colorado, a Henry L. Doherty interest. Through several stages he rose to serve the company as commercial manager, and from that position was elevated to the company management.

Mr. Stannard was a past president of the National Commercial Gas Association, and had also served as vice-president of the American Gas Association.

## Southern Counties Gas Co. Makes Christmas Display Awards

District and sub-district offices of the Southern Counties Gas Co., Los Angeles, Calif., competed in a Christmas floor display contest during December. Following are results of the contest.

District offices: First prize, $15—Pomona; second prize, $10—Santa Monica; honorable mention—Santa Ana.

Sub-district offices: First prize, $10—Laguna Beach; second prize, $5—Culver City; honorable mention—Covina.

Judges for the contest were Fred Champion, Southern Counties Gas Co.; Robert Hornby, Pacific Lighting Corp.; and F. M. Banks, Southern California Gas Co. The contest was held under the direction of W. D. Thurber, advertising manager for the company.

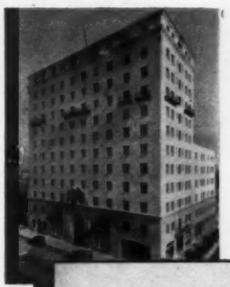
## Change-Over Completed In Canton, Ill.

A crew of 43 men early in January completed natural gas change-over operations in Canton, Ill., for the Central Illinois Public Service Co. Natural gas supply comes through the recently constructed line of the Central Pipe Line Co., known as the Bartonville-to-Canton lateral, and serves Bartonville, Havana, Bushnell, Cuba, Macomb, Lewiston and Canton. The manufactured gas plant from which the Central Illinois Public Service Co. formerly served its consumers will be maintained for stand-by purposes.

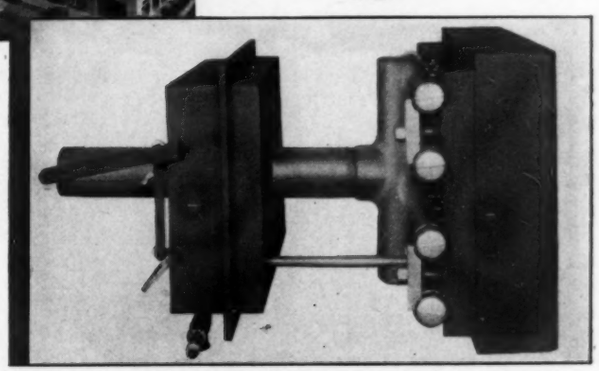
## Office Opened at Manhattan Beach

**The Southern California Gas Co. has established a collection and service office at 1107 Manhattan Avenue, Manhattan Beach, Calif.**

# PIONEERS IN ARIZONA with industrial burners



N. G. E. GAS BURNERS
WILGUS PRESSURE REGULATORS
WEBSTER RADIANT GAS BURNERS
SURFACE COMBUSTION GAS-FIRED INDUSTRIAL FURNACES
BURNERS AND APPLIANCES
JANITROL AND OTHER CONVERSION BURNERS



***Side view of the improved Webster Radiant Low Pressure Gas Burner installed in the Pioneer Hotel at Tucson, Ariz.***

To Natural Gas Equipment, Inc., goes the distinction of making the first installation of Industrial Gas Burners in Tucson. In the Pioneer Hotel of Tucson an improved Webster Radiant Low Pressure Gas Burner is furnishing efficient, dependable service.

The simple, sturdy construction of Webster Burners reduces maintenance cost to the minimum, their design makes for ease of installation. Webster engineers have incorporated a cast iron shutter in this burner with perfectly balanced louvres so that on fall-on or fall-off control the louvre is closed when the fire is off. This prevents unequal expansion and contraction of the boilers as well as conserving heat and maintaining higher operating efficiencies. Burners of various types to meet the requirements of surplus gas utilization are supplied by Natural Gas Equipment, Inc.

**NATURAL GAS EQUIPMENT INC.**

**Petroleum Securities Bldg. LOS ANGELES, CAL.**
**1123 Harrison Street SAN FRANCISCO, CAL.**

**LOOK TO THE PIONEERS FOR CONTINUED LEADERSHIP**

# The Goodman Stopper

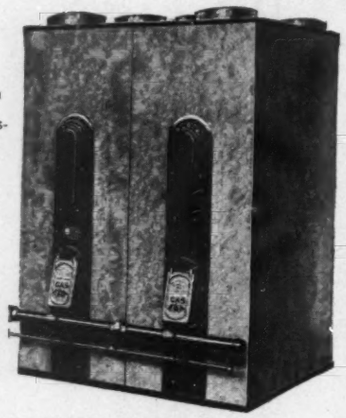
**The Reliable Shut-off for Street Mains**

**Equipped with Improved Patented Locking Sleeve, which locks both handles to the pipe. Stopper cannot slip. Gas cannot pass.**

**Safety Gas Main Stopper Co.**
**523 Atlantic Avenue, Brooklyn, N. Y.**

**Pac. Coast Rep.: C. B. Babcock Co.**
**135 Bluxome Street**
**San Francisco, California**

We make a complete line of gas-fired boilers, pressed steel and cast furnaces.



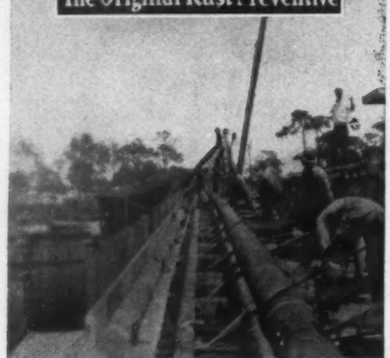
STANDARDIZED design and sectional construction of Mueller Gas Era Furnaces simplify both stocking and installation. Note the compact, simple assembly.
—and write for further details direct to:

L. J. MUELLER FURNACE CO.
2008 W. Oklahoma Ave. Milwaukee

MUELLER
GAS ERA
FURNACES

NRA MEMBER U.S. WE DO OUR PART

NO-OX-ID
IRON-RUST
The Original Rust Preventive



Coated 7½ Years Ago
Present Condition Perfect

This gas line exposed to salt air was protected with NO-OX-ID "A Special" in August, 1926. Recent inspection of the coating produced a report of perfect service: "Just as good as the day it was coated."

NO-OX-ID is easily applied and reasonable in cost. Inquiries invited.

DEARBORN CHEMICAL COMPANY
Los Angeles: 807 Mateo Street
Phone TRinity 3385
San Francisco: 421 Bryant St.
Phone SUtter 8688

# Customer Conference Shows Advertising Preferences

UNDER the chairmanship of W. D. Thurber, advertising manager for the Southern Counties Gas Co., Los Angeles, Calif., a committee of the Los Angeles Advertising Club has concluded a study of customer preferences in advertising, which marked a new approach in methods of advertising research.

*W. D. Thurber*

Proceeding on the maxim that advertising to be successful must be read and must create a favorable impression for the product which it represents, the Los Angeles advertising group decided to stage a series of three "customers' conferences" inviting delegates from representative organizations to contribute their opinions and criticism of current advertising practices through response to a carefully prepared questionnaire. In the list of organizations cooperating were 167 parent-teacher groups, 44 women's clubs, 39 business and professional women's clubs, 39 chambers of commerce and merchants' associations, 20 civic and patriotic societies, and 11 miscellaneous organizations—a total of 342 groups with membership of 300,000 men and women residing in 56 communities of Los Angeles county.

Three sessions of the conference were held in Los Angeles, attended by 3,000 persons. The last session was devoted to university and college students, to gain some knowledge of advertising preferences in the customers of the future.

Questions submitted to the delegates to the three conferences concern themselves with specific phases of newspaper, radio, direct mail, and outdoor advertising plus a few queries on merchandising practices. Some of the conclusions evident from a preliminary analysis of the returns made by Mr. Thurber's committee will be of interest to utility advertising and commercial departments.

Analysis of some 250,000 items produced by this exhaustive customer survey in reply to the 77 questions circulated and in floor discussion at the meetings reveals the following preference trends.

According to the college group reactions, purchasers of the future will spend their money first for basic needs, which is encouraging from the utility service viewpoint. Answering the question which asked for their intentions regarding major expenditures, both college men and women indicated that their first expenditure would go toward a home of their own, with bank savings second, life insurance third, inexpensive car fourth, etc.

Newspapers were the preferred media in a majority of the replies.

Discussion of radio as an advertising medium at the conferences disclosed a general demand for true sincerity and absence of affectation in this type of advertising. There was a great preponderance of desire for classic and popular music on the air, with so-called dramatic programs at the bottom of the list.

Sounding out conference opinion on objectionable features in advertising, a high proportion of replies objected to use of superlatives in copy. Testimonial advertising also appeared to register unfavorably both with the delegate group and with the college group.

## Medicine Bow-Dutton Creek Line Nearing Completion

Illinois Pipe Line Co. has completed stringing 22 miles of 6- and 8-inch pipe on its line from Medicine Bow to Dutton Creek, Wyo. At Dutton Creek the line will connect with an existing line to Laramie which is at present getting its gas supply from Dutton Creek. A 5-mile line of the Rocky Mountain Gas Co. from Allen Lake serves Medicine Bow. The Ohio Oil Co., Casper, Wyo., of which the Rocky Mountain Gas Co. is a subsidiary, recently completed a 17,000,000 cubic foot gas well at Allen Lake.

## Advertising Association to Run Annual "Better Copy" Contest

Public Utilities Advertising Association will again conduct its nation-wide annual "Better Copy" contest this year. Louis D. Gibbs, assistant head of the public relations bureau, Edison Electric Illuminating Co. of Boston, is chairman of the Better Copy committee and all entries in the contest should be addressed to him at 182 Tremont St., Boston, Mass.

## Harnischfeger Corp. Issues New Bulletin

The Harnischfeger Corp., Milwaukee, Wis., has issued a new bulletin No. RH-1, treating of the design, construction and operation of modern hoists. The bulletin lists the ratings and operating ranges for type "R" hoists along with specifications and electrical accessories. Copies may be had upon application to the company's agents and representatives or to the factory directly.

## Victoria Gas Co. Extensions

Victoria Gas Co., Victoria, B. C., subsidiary of B. C. Electric Railway Co. of Vancouver, plans to extend its mains south of Windsor Road in Oak Bay, through to Uplands. Cloverdale, Esquimalt and Saanich also probably will be included in the extension. All of the above districts are now being surveyed for the project.

## Texas Cities Paris Offices Enlarged

District office facilities of the Texas Cities Gas Co. at Paris, Texas, are being extended to afford larger display room and business offices. A. P. Rowland is manager at Paris for Texas Cities, which headquarters in Dallas, Texas.

## Mamou, La., to Vote on Federal Loan

Mamou, La., is calling a special election February 20 to determine whether the city may borrow $55,000 from the government for construction of a municipal gas plant.

# Welsbach HOTZONE

## Self-action storage gas water heater

### RAPID RECOVERY OR BUDGET TYPE

Are consistently rendering efficient service. They are built right. Their moderate price and unique safety devices assure their conforming to your high standards even though your sales plan includes the renting of water heaters.

WELSBACH HIGHLY DEVELOPED SAFETY DEVICES ARE FURNISHED

HEATERS ARE MADE IN ALL DOMESTIC SIZES WITH 300 LB. TEST GALVANIZED OR EVERDUR TANK

APPROVED BY A. G. A. LABORATORY

PLEASE TELL US TO SEND FURTHER DETAILS

Welsbach COMPANY

Gloucester, N. J.

NRA WE DO OUR PART

50 Hawthorne St.
San Francisco, Calif.

226 S. Wabash Ave.
Chicago, Ill.

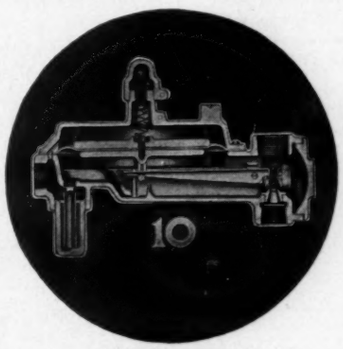


# 3 OF A KIND~

REYNOLDS 10 - 20 - 30 Regulators are a winning combination for every type of service requirement. Reynolds regulators have proved their superiority over a period of 40 years. However, it is one thing to claim superiority but quite another to back it up with untampered facts. Reynolds have the back records of performance, measured in terms of years, in their files. From where are these records taken? Here, there, and everywhere, where gas is used for commercial purposes.

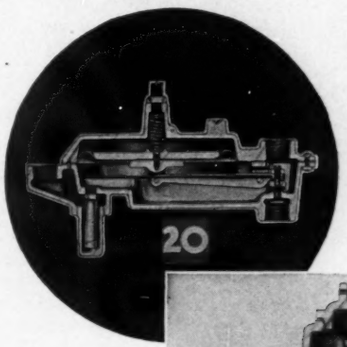
**What do they show? Satisfaction.**

In order to improve manufacturing methods and introduce new developments, Reynolds compare the results gathered over years of actual operating performance with the original specifications of the Regulators and, also, determine for what length of time the Regulators fulfill the needs of the particular type of installation. In this way Reynolds keep their products keyed to the needs of a fast moving industry.



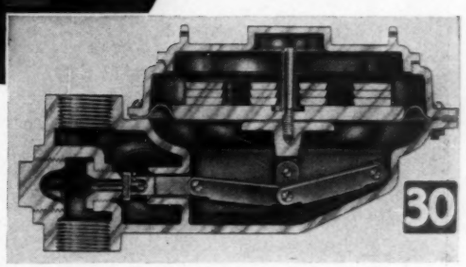

For complete information write to either the Factory, Branch Offices, or Representatives.

Model 10–all parts accessible and interchangeable while in pipe line.




Model 20 – working parts so accurate as to permit complete interchangeability in shop.

Model 30–is manufactured in either spring or dead weight adjustment for horizontal or vertical connections.




NRA WE DO OUR PART

*Reynolds Branch Offices:*

421 Dwight Bldg.
Kansas City, Missouri

2nd Unit, Sante Fe Bldg.
Dallas, Texas

*Representatives:*

Eastern Appliance Co.
Boston, Mass.

F. E. Newberry
Avon, New Jersey

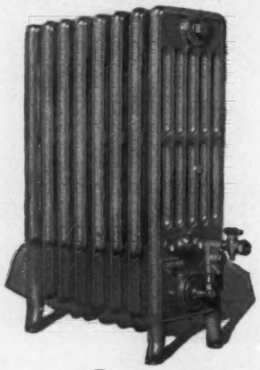
G. H. Unkefer
428 Boyd St.
Los Angeles, Calif.

**REYNOLDS GAS REGULATOR CO.**

**ANDERSON, INDIANA, U. S. A.**

GAS CONTROL SINCE 1892

AGP
GAS-FIRED
STEAM RADIATORS



Embody every modern feature of American Radiator design. Slim tubes provide maximum contact of air to heating surface. Screw nipple construction does away with unsightly, dirt-catching tie rods. Provides maximum strength. Especially necessary in a long radiator.

In-Airid air venting valve. Installed *inside* the radiator. Thermal control, controls gas supply according to radiator temperature. Blue flame, Venturi type burner.

AMERICAN GAS AGP PRODUCTS CORP.
40 West 40th Street, New York, N. Y.
Division of AMERICAN RADIATOR COMPANY

Unusual features of Electrogas FLOOR FURNACES

1 Compact hollow fins
2 Streamlined 98% vertical
3 Large heating area
4 No flat surfaces
5 Open base
6 Built-in diverter
7 Easy to clean thru top

also BASEMENT FURNACES

Electrogas
FURNACE & MANUFACTURING CO.
4575 Bayshore Blvd., *San Francisco*
164 South Central Ave., *Los Angeles*

# Southern California Gas Systems Suffer Flood Damage

UNPRECEDENTED rainfall in Southern California, extending from December 30 to January 1, took its toll of the local gas facilities and called repair crews into fast action. During the storm occurred the heaviest 24-hour percipitation ever recorded in Los Angeles, amounting to 7.31 inches.

Stand-by manufacturing plants of Southern California Gas Co. and Los Angeles Gas and Electric Corp. were ready for service at a moment's notice. They were not required, but had the storm lasted another two hours at least two major gas transmission lines from San Joaquin fields would have gone out.

Most of the damage was concentrated on the Southern California Gas Co. system, though Southern Counties Gas Co.'s 12-inch line from the Ventura fields was undermined at a point near the head of San Fernando Valley. Special supports were installed in time and service was not interrupted.

Southern California Gas Co. suffered the loss of 4,585 feet of main, 213 broken services, and 382 lost or damaged meters. House meters in some cases were found several miles away from their premises.

Most of the damage in residential districts occurred in the Montrose-La Crescenta and Glendale districts, where a sea of mud and debris inundated homes and covered streets several feet deep in some sections.

Gas service was disrupted in the Montrose area but was maintained in North Glendale despite the fact that four lines across the Verdugo Wash were swept away. Reconstruction work on the gas system was begun January 2 and carried forward with all possible speed.

Some of the principal damage was to pipe lines, due to cloudbursts which sent walls of water rushing down canyons. One of Southern California Gas Co.'s 12-inch lines was pulled apart at a damaged trestle. Southern Fuel Co.'s 26-inch line, a main source of the Los Angeles area supply, was exposed at

*Settling roadways and flood waters uncovered Southern California Gas Co.'s 26-inch pipe line at Slauson and LaBrea, Los Angeles, just south of Inglewood Field.*

points. Southern California Gas Co.'s 26-inch line, another major feeder, was exposed for a distance of 800 feet in Sepulveda Canyon. Settling roadways also endangered the company's 26-inch line south of the Inglewood oil field (see photo above).

## R. G. Coad Heads Omaha Utilities Dept.

Ralph G. Coad was elected chairman of the Metropolitan Utilities District in Omaha, Neb., early in January. Gas sales of the District increased nearly 40 million cubic feet in 1933 over the year previous, according to the annual sales report. The report showed that gas consumption increased more than 420 million cubic feet since 1929, totaling approximately 2 billion cubic feet in 1933.

## San Diego Cons. Gas and Electric Reports Excellent Safety Record

The San Diego (Calif.) Consolidated Gas and Electric Co. reports an excellent safety record for 1933, with no death from injuries during the year. The frequency of time lost due to injuries in 1933 compared with 1932 amounted to a reduction of 58.21 per cent. Forty-six injuries requiring doctors' treatment were reported during the year, against 111 for 1932.

## Largest January Refrigerator Sales

Electrolux Refrigerator Sales, Inc., announces that January orders for gas refrigerators are over 300 per cent higher than for the same period in 1933, representing the largest January sales in the company's history, according to F. E. Sellman, vice-president of the company.

## Rolla, Mo. Votes to Make R.F.C. Application for Municipal Plant

The city council of Rolla, Mo., has recently voted to apply for R. F. C. funds for the construction of a municipal gas plant to cost $55,000. G. E. Wells Co., Inc., engineering firm of St. Louis, Mo., has been appointed to make the survey and to present formal application for the loan.

## 4,000 New Heating Consumers on Public Service Co. of No. Ill. Lines

In a recent campaign conducted by the Public Service Co. of Northern Illinois, Chicago, 4,000 new househeating customers were added to the system. The company expects to double this quota for 1934.

## Neodesha to Improve Gas System

The city of Neodesha, Kans., recently voted a $35,000 bond issue for the purpose of improving and extending its natural gas distribution system.

# DIRECTORY


**Byllesby Engineering and Management Corporation**

**Wholly-owned subsidiary of Standard Gas and Electric Company**

**231 South La Salle Street, Chicago**
**New York Pittsburgh San Francisco**

**• HYDRAUGER •**
**MODERN HORIZONTAL BORING MACHINE**
**For Underground Installation of Pipe and Conduits. Avoids damage to costly Pavements and saves time. Send for Bulletin.**
**HYDRAUGER CORPORATION, Ltd.**
**343 Sansome Street • San Francisco, California**

**QUIET**
GENERAL MAGNETIC GAS VALVE FEATURES:
Electric Hum Eliminated, ½-3" sizes. Low and High Voltage. Built for High Pressure Gas. Made in slow-opening types. Simple in Design—Infallible in Operation—Low in Price.
GENERAL CONTROLS CO., LTD.
1539 Folsom St. San Francisco

**DANIEL ORIFICE FITTING**
MEETS THE SEVEREST OPERATING CONDITIONS
LET US TELL YOU OF OUR LATEST DEVELOPMENTS
DANIEL ORIFICE FITTING CO.
1900 SANTA FE AVE. LOS ANGELES

**SHEER** 31-A MOTOR GAS VALVE
Now Entering Its Third Year
LEADS IN PERFORMANCE AND LOW PRICES
Also Hi-Lo Gas Valve, Step-Opening Gas Valve, Thermostats, Safety Pilots, Limit Controls, Space Heater Regulators, Humidifiers, Etc. . . . .
WRITE FOR CATALOG
H. M. SHEER CO., QUINCY, ILL.

**GAS PIPE LINE MAP**
**Compiled by the Editors of WESTERN GAS**
**Size 45" x 45"**
**The most comprehensive published; covers the 22 western states in detail. Gives gas fields, names of natural gas communities; sizes of pipe lines and names of pipe line companies.**
**PRICES:**
**Printed on Cloth, $3.50**
**WESTERN GAS**
**810 South Spring St. Los Angeles, Calif.**

**"MODERNIZE as you repair"**

**THE SPRAGUE METER COMPANY**
BRIDGEPORT, CONN.
Los Angeles, Calif. San Francisco, Calif.
Davenport, Iowa.
Newark, Ohio. Houston, Texas.

The heater that smiles while it warms

FRASER

Radiant Front Console

Imagine a circulating heater with all the added advantages of a cheerful open fireplace. It is absolutely new—a revolutionary contribution to gas heating.

*Manufactured by*

**Fraser Furnace Company**

Stockton, California

*Distributed by*

**H. R. Basford Company**

San Francisco Los Angeles

SOUTH CHESTER STEEL PIPE

**Excels for Gas Service**

The unusual care given to accuracy of diameter and welding qualities, makes Chester Pipe a favorite for gas lines.

SOUTH CHESTER TUBE CO.

Chester, Pa.

## F. C. Suffron Research Head at A.G.A. Laboratory

THE A. G. A. Testing Laboratory recently announced appointment of F. C. Suffron as head of the research department to fill the vacancy created by the resignation of W. M. Couzens on December 1, 1933.

Mr. Suffron has a background of 20 years experience in the field of engineering, the majority of which time he spent in the gas industry.

He graduated in civil engineering from Oregon State College in 1915. From 1916 to 1920 he was employed as engineer of tests for Smith, Emery & Co., consulting engineers and chemists, of San Francisco, Calif. For the succeeding nine years Mr. Suffron was associated with the Portland Gas & Coke Co., Portland, Ore., as an engineer in the distribution department. During 1930 and the early part of 1931 he was gas distribution engineer for the Washington Gas & Electric Co., from which position he resigned to come with the A. G. A. Testing Laboratory in Cleveland.

During the past three years Mr. Suffron has been engaged largely in research at the testing laboratory. The investigation of pipe joints, including the completion of the work on bell and spigot joints and mechanical joints, together with the development of the Weld Test Indicator, was under his supervision in 1931 and 1932. A large part of his time during the past year was devoted to requirements research activities.

## W. P. Treide of Los Angeles Appliance Firm Dies

William Phillip Treide, owner and operator of the Gas Appliance Co., Los Angeles, Calif., passed away January 7, after many years service in the gas industry of Southern California. Prior to the World War he was with the Beacon Light Co. of Los Angeles for a number of years. Upon his return he organized his own company, and operated it until the time of his death. Mr. Treide was 47 years old.

George Pearse of the Beacon Light Co. is taking over the stock of the Gas Appliance Co. and will operate the two companies at the Gas Appliance Co.'s present location.

## Liberty, Mo., Has New Gas Supply From General Utilities Line

The General Utilities Co., headquartered in Kansas City, Mo., has completed a 16-mile, 4-inch pipe line to supplement gas supply to 800 meters on The Liberty (Mo.) Gas & Service Co. system, subsidiary of General Utilities. The line originated in the Plattsburg field in Clinton County and terminated in the Smithville field, Clay County, whence Liberty has been provided its supply, according to James B. Nourse, trustee in receivership for the General Utilities Co.

## Engineering Experiment Station Publishes New Bulletin

The Engineering Experiment Station at University of Washington, Seattle, announces the publication of Bulletin No. 72 entitled "The Derivation of the Mean Temperature Difference Between a Saturated Gas and a Cooling Liquid, and also the Derivation of the Mean Velocity of Such Gas".

# Classified Advertising

**Classified advertising five cents per word; minimum $2.00 per insertion. Situation Wanted advertisements up to 50 words will be published three consecutive issues without charge. Small professional cards 1-in. deep by 21 ems wide are $6.00 monthly on 12-time contract.**

### Situations Wanted

Situation wanted by gas engineer, technical graduate; 34 years old; 10 years with affiliated holding and operating companies. Experience covers high and low pressure distribution and transmission, coal and water gas manufacture, natural and refinery gas distribution; particularly experienced on unaccounted-for gas problems. References. Address Box 241, *Western Gas,* 810 South Spring St., Los Angeles, Calif.

Situation wanted by young man skilled in business management, accounting and auditing. Highest references can be furnished as to character, integrity and ability. Address Box 243, *Western Gas,* 810 South Spring St., Los Angeles, Calif.

Situation wanted by gas manager and engineer; university graduate; 22 years in all branches, water gas, coal gas, oven gas, natural gas, high and low pressure distribution. Address Box 239, *Western Gas,* 810 South Spring St., Los Angeles, Calif.

## Gas Service Reports Gain in Industrial Sales

The Gas Service Co., Kansas City, Mo., reports a 6.5 per cent gain in industrial gas sales for the first 11 months of 1933 compared to the same period in 1932, or an increase of 821,454 M c.f. The number of industrial consumers for the period increased 16 over the same period of the preceding year.

## Community Nat. Gas Co. Opens New Hugo, Okla., Offices

Community Natural Gas Co., Dallas, Texas, has purchased and remodeled a building in Hugo, Okla., to house the company's district office, display room and warehouse. Joe C. Darrow is manager of the Hugo district for Community Natural.

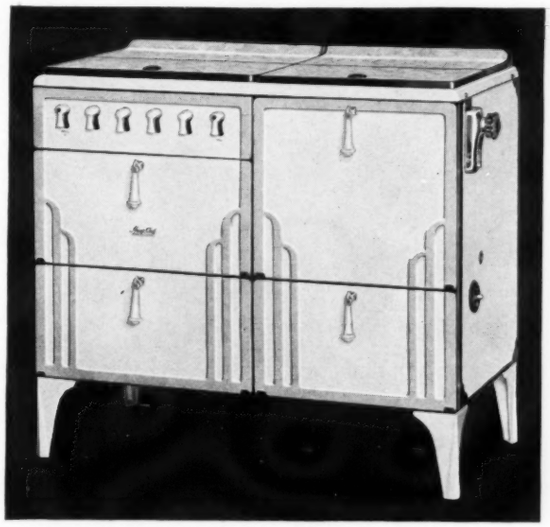
## J. M. Lynn, Sales Supervisor Dallas Gas Company

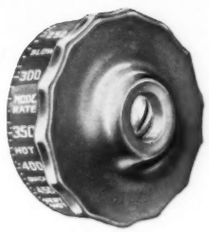
J. M. Lynn has assumed the duties of sales supervisor for the Dallas (Texas) Gas Co., succeeding S. C. Grasinger who recently resigned this position after four years of service with the company.

# Magic Chef

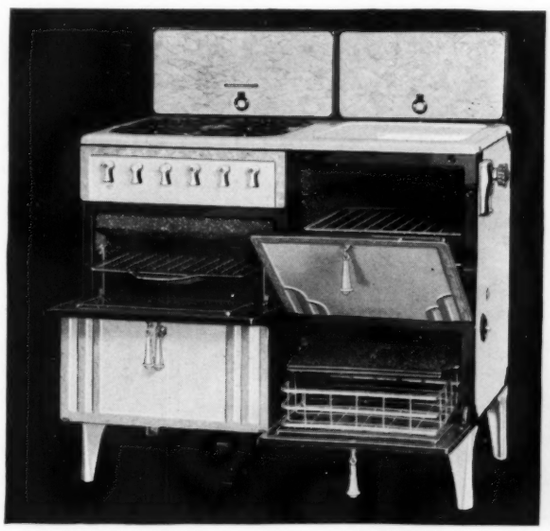
AMERICAN STOVE COMPANY

**AS MODERN AS TOMORROW'S NEWSPAPER**





Look for the RED WHEEL
When you buy a MAGIC CHEF



# MAGIC CHEF
## GAS RANGE
# SERIES 1900
## *with*
## ELEVATED BROILER

HERE'S a new Magic Chef series that will make an instant appeal to the modern housewife. In addition to all other advanced Magic Chef features, Series 1900 has an *Elevated Broiler* of the handy drawer type, located just under the manifold.

The broiler is entirely separated from the oven and has its own burner specially drilled to give a direct, even flame. Thus broiling can be done without interfering in any way with the operation of the oven.

The elevated position of the broiler does away with awkward stooping, making broiling decidedly more comfortable and convenient.

The space beneath the oven, fitted with a special baffle to shut off excessive heat from oven burner and a spot welded plate basket, can be used either as a warming compartment or for utensil storage.

Series 1900 comes in four finishes—white with black trim, ivory with black trim, ivory with tan trim, ivory with green trim . . . Write for color illustrations and full description.

**AMERICAN STOVE COMPANY**

*World's Largest Manufacturer of Gas Ranges*

BOSTON • • • • NEW YORK • • • • PHILADELPHIA
ATLANTA • • CLEVELAND • • CHICAGO • • ST. LOUIS
LOS ANGELES • • • • SAN FRANCISCO • • • • SEATTLE

# WHERE ELSE WILL YOUR DOLLAR BUY ALL THESE FEATURES?

As a buyer or user of pipe, make a list of the desirable features that you think would make up the ideal pipe—and you will find them all in Republic Electric Weld Casing, Tubing and Line Pipe.

This pipe stands alone. It is made possible by Republic's patented process of welding by electrical resistance. Clean strip steel of the required ductility and tensile strength is formed to a perfect round, then welded without the addition of foreign metal and without heating except at and adjacent to the weld. The resulting pipe is free from dirt, scale and surface defects, round, uniform in wall thickness and diameter, and perfectly straight. It can be made in lengths up to fifty feet and of steel to meet any required strength or ductility.

So the answer is plain—nowhere else will your pipe dollar buy more than it will when you specify Republic Electric Weld Pipe. We shall be glad to send you an interesting book explaining in full the manufacturing process and making clear how all the features of this remarkable pipe are made possible by this process.

## REPUBLIC ELECTRIC WELD LINE PIPE • CASING • TUBING

**REPUBLIC STEEL CORPORATION**
GENERAL OFFICES YOUNGSTOWN, OHIO